LIFE-SPAN
DEVELOPMENT

Thirteenth Edition

JOHN W. SANTROCK

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LIFE-SPAN
Development

Thirteenth Edition

JOHN W. SANTROCK
University of Texas at Dallas

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With special appreciation to
my mother, Ruth Santrock, and
the memory of my father, John Santrock

about the author

John W. Santrock

John Santrock received his Ph.D. from the University of Minnesota in 1973. He taught at the University of Charleston and the University of Georgia before joining the Program in Psychology and Human Development at the University of Texas at Dallas, where he currently teaches a number of undergraduate courses and was given the University's Effective Teaching Award in 2006.

John Santrock, teaching in his undergraduate course in life-span development.

John has been a member of the editorial boards of *Child Development* and *Developmental Psychology*. His research on father custody is widely cited and used in expert witness testimony to promote flexibility and alternative considerations in custody disputes. John also has authored these exceptional McGraw-Hill texts: *Psychology* (7th edition), *Children* (10th edition), *Adolescence* (12th edition), *Topical Life-Span Development* (4th edition), and *Educational Psychology* (4th edition).

For many years, John was involved in tennis as a player, teaching professional, and coach of professional tennis players. He has been married for more than 35 years to his wife, Mary Jo, who is a realtor. He has two daughters—Tracy, who is also a realtor, and Jennifer, who is a medical sales specialist at Medtronic. He has one granddaughter, Jordan, age 19, and two grandsons, Alex, age 6, and Luke, age 4. Tracy recently completed the New York Marathon, and Jennifer was in the top 100 ranked players on the Women's Professional Tennis Tour. In the last decade, John also has spent time painting expressionist art.

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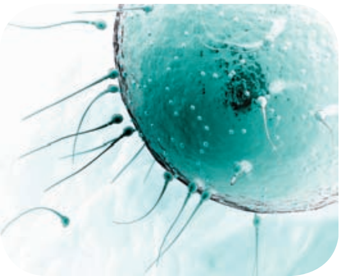

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expert consultants

Lifespan Development has become an enormous, complex field and no single author, or even several authors, can possibly keep up with all of the rapidly changing content in its many different areas. To solve this problem, author John Santrock sought the input of leading experts about content in a number of areas of human development. The experts provided detailed evaluations and recommendations in their area(s) of expertise. The biographies and photographs of the experts, who literally represent a who's who in the field of development, follow.

K. Warner Schaie is widely recognized as one of the pioneers who created the field of lifespan development and continues to be one of its leading experts. He is currently the Evan Pugh Professor Emeritus of Human Development and Psychology at the Pennsylvania State University. Dr. Schaie also holds an appointment as Affiliate Professor of Psychiatry and Behavioral Sciences at the University of Washington. He received his Ph.D. in psychology from the University of Washington, an honorary Dr. phil. from the Friedrich-Schiller University of Jena, Germany, and an honorary Sc.D. degree from West Virginia University. He received the Kleemeier Award for Distinguished Research Contributions and the Distinguished Career Contribution to Gerontology Award from the Gerontological Society of America, the MENSA lifetime career award, and the Distinguished Scientific Contributions award from the American Psychological Association. He is author or editor of 62 books including the textbook *Adult Development and Aging* (5th edition, with S. L. Willis) and the *Handbook of the Psychology of Aging* (6th edition, with J. E. Birren). He has directed the Seattle Longitudinal Study of cognitive aging since 1956 and is the author of more than 300 journal articles and chapters on the psychology of aging. His current research interests focus on the life course of adult intelligence, its antecedents and modifiability, the impact of cognitive activity in midlife on the integrity of brain structures in old age, the early detection of risk for dementia, and methodological issues in the developmental sciences.

"In my opinion, John Santrock's book continues to be by far the best lifespan developmental psychology text available that is suitable for a broad undergraduate audience as well as a comprehensive treatment for professionals in other fields who need a scholarly but very readable overview of major issues and current research on human development from birth to old age and death. The 13th edition is as usual an excellent update of the current research literature." **–K. Warner Schaie,** *Pennsylvania State University*

Diane Hughes is a leading expert on diversity and children's development. Following her doctoral work at the University of Michigan, she became a professor in the Department of Psychology at New York University and currently is a faculty member in the Steinhardt Department of Applied Psychology at New York University. Dr. Hughes is a community and developmental psychologist who examines ethnicity and race as contexts for parenting and adolescent development. She seeks to discover how parents from a range of ethnic backgrounds communicate information about ethnicity and race in the course of their everyday routines and practices. Dr. Hughes and her colleagues have been awarded multi-million-dollar grants from the National Science Foundation to establish and maintain the Center for Research on Culture, Development, and Education at New York University.

"Thank you for the opportunity to review the chapters. What an impressive contribution. Reading John Santrock's chapters is always informative and thought provoking for me." **–Diane Hughes** *New York University*

Ross Thompson is one of the world's leading experts on children's socioemotional development. He currently is Professor of Psychology at the University of California–Davis. His research interests are in two fields. First, as a developmental psychologist, he studies early parent-child relationships, the development of emotional understanding and emotion regulation, conscience development, and the growth of self-understanding. Second, as a psycholegal scholar, he works on the applications of developmental research to public policy concerns, including the effects of divorce and custody arrangements on children, child maltreatment prevention, school readiness, research ethics, and early brain development and early intervention. Dr. Thompson is a founding member of the National Scientific Council on the Developing Child and was a member of the Committee on Integrating the Science of Early Childhood Development of the National Academy of Sciences that produced the book, *From Neurons to Neighborhoods: The Science of Early Childhood Development*. He is a member of the Board of Directors of Zero to Three: National Center for Infants, Toddlers, and Families, and is on the Editorial Advisory Board of *Wondertime* magazine. Dr. Thompson has twice been Associate Editor of *Child Development*, and is Consulting Editor for a series of topical texts in developmental psychology published by McGraw-Hill. His books include *Preventing Child Maltreatment Through Social Support: A Critical Analysis*; *The Postdivorce Family: Children, Families, and Society* (coedited with Paul Amato); and *Toward a Child-Centered, Neighborhood-Based Child Protection System* (coedited with Gary Melton and Mark Small). He is currently working on two books: *Early Brain Development, the Media, and Public Policy* and *Emotional Development*. Dr. Thompson has been a Visiting Scientist at the Max Planck Institute for Human Development and Education in Berlin, a Senior NIMH Fellow in Law and Psychology at Stanford University, and a Harris Visiting Professor at the University of Chicago. He received the Boyd McCandless Young Scientist Award for Early Distinguished Achievement from the American Psychological Association, the Scholarship in Teaching Award, and the Outstanding Research and Creative Activity Award from the University of Nebraska, where he was also a lifetime member of the Academy of Distinguished Teachers.

"Once again, reading these draft chapters was a pleasure. The writing is clear, cogent, and easy to follow, and the major research topics are presented in a current and engaging manner. I like very much the "connections" that John Santrock is striving to create for this edition: Connections between topics in a chapter and issues discussed earlier or later in the text; connections between developmental research and personal growth; connections between research and development; and connections between science and research careers. I think students will respond well to these." **–Ross Thompson** *University of California at Davis*

William Hoyer is one of the world's leading experts on cognitive aging. He currently is professor of psychology and senior scientist at the Center for Health and Behavior at Syracuse University, where he teaches courses in adult development and aging. At Syracuse, he also is an associate of the Gerontology Center, director of the Graduate Training Program in Experimental Psychology, and research professor of ophthalmology at Upstate Medical University. Dr. Hoyer obtained an undergraduate degree in psychology from Rutgers College, and M.S. and Ph.D. in experimental psychology from West Virginia University. His research interests center on skill learning, memory, and cognitive expertise from a developmental perspective. Dr. Hoyer is currently the principal investigator on a five-year research grant titled "Aging of Cognitive Mechanisms" from the National Institute on Aging. His publications include seven books and over 100 articles in such journals as Developmental Psychology, Psychology and Aging, and Journal of Gerontology: Psychological Sciences. Dr. Hoyer is a Fellow of the American Psychological Association, the American Psychological Society, and the Gerontological Society of America. He serves or has served on a number of grant review panels and on the editorial boards for journals, including Developmental Psychology; Journals of Gerontology: Psychological Sciences; Aging, Neuropsychology, and Cognition; and Psychology and Aging.

"Obviously it is a difficult task for a seasoned author and teacher to scrap or de-emphasize findings and perspectives that have evolved over the past two decades and in their place embrace and characterize the latest trends and new findings in the field. It is my opinion that John Santrock has an amazing knack for identifying the significant topics and issues in the field as they emerge and for presenting these topics and issues in ways that will be of interest and relevance to today's students . . . Unlike several of the competitors, John Santrock successfully sidesteps the fads and superficial topics—instead, he opts for presenting scientifically-sound material that is fresh, innovative, and impactful in an applied sense . . . John Santrock's approach to the material, that is, his emphasis on Connections, exploits new and emerging cross-linkages in the field" . . . In sum, most striking is John Santrock's skill to characterize the latest, best findings and ideas in this diverse field that spans from infancy to old age, from cells to culture, and from very technical to practical, and to effectively adapt this material to students. **–William Hoyer** *Syracuse University*

Elena Grigorenko is a leading expert on intelligence and heredity-environment issues. She currently is Associate Professor of Child Studies and Psychology at Yale, as well as Adjunct Professor of Psychology at Columbia University (USA) and Moscow State University (Russia). Dr. Grigorenko has published more than 250 peer-reviewed articles, book chapters, and books. She has received awards for her work from five different divisions of the American Psychological Association. She recently won the APA Distinguished Award for an Early Career Contribution to Developmental Psychology. Dr. Grigorenko's research has been funded by NIH, NSF, DOE, Cure Autism Now, the Foundation for Child Development, the American Psychological Foundation, and other federal and private sponsoring organizations.

"The 13th Edition of Life-Span Development is a nice update." **–Ellen Grigorenko** *Yale University*

Joseph Campos is one of the world's leading experts on infants' and children's emotional development. He currently is a professor in the Department of Psychology at the University of California, Berkeley. Dr. Campos is President of the International Study of Infant Studies, and previously was the first Executive Officer of the International Society for Research on Emotions. He has co-authored (with Michael Lamb) *Development in Infancy* and has co-edited one of the volumes of the *Handbook of Child Psychology* in multiple additions, as well as contributing major reviews of infant emotional development for this handbook. Dr. Campos also published *Emotions inside out: 130 years after Darwin's Expression of the Emotions in Man and Animals*. He holds Distinguished Teaching Awards from the University of Denver and the University of Illinois at Urbana-Champaign, and also is Distinguished Guest Professor at Beijing
Normal University.

"I have always enjoyed John Santrock's writing and reviews, and this book is no exception. . . The treatment of temperament is very good." **–Joseph Campos** *University of California at Berkeley*

Linda Mayes is a leading expert on prenatal development, infancy, and early childhood. She currently is the Arnold Gesell Associate Professor of Child Psychiatry, Pediatrics, and Psychology in the Yale Child Study Center. Dr. Mayes is also Special Advisor to the Dean in the Yale School of Medicine and chairman of the directorial team of the Anna Freud Centre, London. Her research integrates perspectives from child development, behavioral neuroscience, psychophysiology and neurobiology, developmental psychopathology, and neurobehavioral teratology. She has published widely in the developmental psychology, pediatrics, and child psychiatry literature. Her work focuses on stress-response and regulatory mechanisms in young children at both biological and psychosocial risk. She has made contributions to understanding the mechanisms involved in prenatal stimulant exposure and the development of arousal regulation. Dr. Mayes' research also has contributed to a better understanding of links between dysfunctional emotional regulation and impaired prefrontal cortical function in young children. Her laboratory currently follows two longitudinal cohort. One study focuses on prenatal exposure to drugs and adolescent development; another examines the influence of growing up in economically deprivation conditions on emerging executive control functions in preschool and early school-aged children. Also, with other colleagues in the Center, she studies how adults transition to parenthood and the basic neural circuitry of early parent-infant attachment using both neuroimaging and electroencephalographic techniques.

"The chapter (3, Prenatal Development and Birth) *is comprehensive and clearly written. It provides students with a good introduction to this period of development."* **–Linda Mayes** *Yale University*

Arthur Kramer is Swanlund Chair and Professor of Psychology. He received his Ph.D. in Cognitive/Experimental Psychology from the University of Illinois in 1984. He holds appointments in the Department of Psychology, Neuroscience program, and the Beckman Institute. Professor Kramer's research projects include topics in Cognitive Psychology, Cognitive Neuroscience and Human Factors. A major focus of his labs recent research is the understanding and enhancement of cognitive and neural plasticity across the lifespan. He is the Director of the Biomedical Imaging Center and Co-Director of the NIH Center for Healthy Minds. Professor Kramer served as an Associate Editor of *Perception and Psychophysics* and is currently a member of seven editorial boards. He is a fellow of the American Psychological Association, American Psychological Society, a member of the executive committee of the International Society of Attention and Performance, and a recent recipient of a NIH Ten Year MERIT Award. Professor Kramer's research has been featured in a long list of print, radio and electronic media including the *New York Times, Wall Street Journal, Washington Post, Chicago Tribune, CBS Evening News, Today Show, NPR* and *Saturday Night Live.*

"… I very much enjoyed reading Chapters 17 (Physical Development and Aging) and 18 (Cognitive Development and Aging) of the 13th edition of Life-Span Development. The material is up-to-date and the different connections that are integrated within the chapters render the material quite accessible to today's students." **–Arthur Kramer** *University of Illinois at Urbana-Champaign*

Karen Fingerman is a leading expert on aging, families, and socioemotional development. She currently is the Berner Hanley Professor in Gerontology at Purdue University. Dr. Fingerman has published numerous scholarly articles on the positive and negative aspects of relationships involving mothers and daughters, grandparents and grandchildren, friends, acquaintances, and peripheral social ties. The National Institute on Aging has funded earlier work on problematic social ties across the lifespan and currently is funding her research on parents and grown children. The Brookdale Foundation and the MacArthur Transitions to Adulthood group also have funded her research. Dr. Fingerman has received the Springer Award for Early Career Achievement in Research on Adult Development and Aging from Division 20 of the American Psychological Association in and the Margret Baltes Award for Early Career Achievement in Behavioral and Social Gerontology from the Gerontological Society of America.

"I think the Developmental Connections idea will be a big plus for this book. Students will find that very helpful and instructors will as well. I was very impressed with how up-to-date the research is across the board. I appreciated the updated information regarding brain development and neuroscience." **–Karen Fingerman** *Purdue University*

Deborah Carr is a leading expert on dying, widowhood, end-of-life decision-making, and families in older adults. She is currently an associate professor in the department of sociology and Institute for Health, Health Care Policy and Aging Research at Rutgers University. Dr. Carr obtained her Ph.D. in sociology at University of Wisconsin. She is author or editor of several books, including *Encyclopedia of the Life Course and Human Development*, and *Spousal Bereavement in Later Life* (with Randolph Nesse and Camille Wortman), and has authored more than 50 journal articles and book chapters. Dr. Carr is a fellow of the Gerontological Society of America and a member of the honorary Sociological Research Association. She has also served as deputy editor of *Journal of Marriage and Family*, and an editorial board of many journals including *Journal of Health and Social Behavior*, and *Journal of Gerontology: Social Sciences*.

"I very much enjoyed reading the text and appreciate the thought and care John Santrock devoted to meeting the needs of students, and addressing the concerns of past reviewers. The text is interesting, engaging, and does a superb job of covering a vast amount of material in a clear and straightforward way." **–Deborah Carr** *Rutgers University*

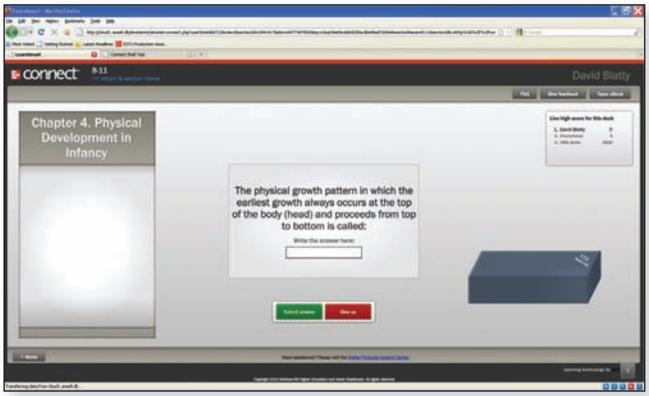
Making Connections . . . From My Classroom to *Life-Span Development* to You

Having taught lifespan development every semester for 25 years now, I'm always looking for ways to improve my course and *Life-Span Development*. Just as McGraw-Hill looks to those who teach the lifespan development course for input, each year I ask the almost 200 students in my lifespan development course to tell me what they like about the course and the text, and what they think could be improved. What have my students told me lately about my course and text? Students said that highlighting connections among the different aspects of lifespan development would help them to better understand the concepts. As I thought about this, it became clear that a *connections* theme would provide a systematic, integrative approach to the course material. I used this theme to shape my current goals for my lifespan development course, which, in turn, I've incorporated into *Life-Span Development:*

1. **Connecting with today's students** To help students *learn* about lifespan development more effectively
2. **Connecting research to what we know about development** To provide students with the best and most recent *theory and research* in the world today about each of the periods of the human life span
3. **Connecting developmental processes** To guide students in making *developmental connections* across different points in the human life span
4. **Connecting development to the real world** To help students understand ways to *apply* content about the human life span to the real world and improve people's lives; and to motivate you to think deeply about *your own personal journey through life* and better understand who you were, are, and will be

Connecting with Today's Students

In *Life-Span Development*, I recognize that today's students are as different in some ways from the learners of the last generation as today's discipline of lifespan development is different from the field thirty years ago. Students now learn in multiple modalities; rather than sitting down and reading traditional printed chapters in linear fashion from beginning to end, their work preferences tend to be more visual and more interactive, and their reading and study often occur in short bursts. For many students, a traditionally formatted printed textbook is no longer enough when they have instant, 24/7 access to news and information from around the globe. Two features that specifically support today's students are the adaptive diagnostic tool and the learning goals system.

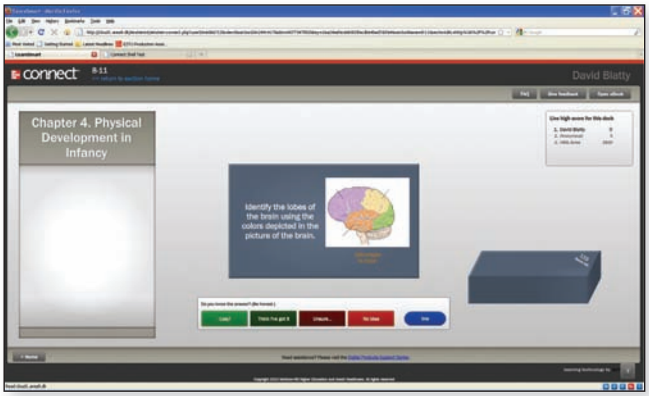


The physical growth pattern in which the earliest growth always occurs at the top of the body (head) and proceeds from top to bottom is called:

Adaptive Diagnostic Tool

Connect Psychology is our response to today's student. The groundbreaking adaptive diagnostic tool helps students "know what they know" while helping them learn what they don't know through engaging interactive exercises, click/drag activities, the Milestones program, and video clips. Instructors using Connect are reporting that their students' performance is improving by a letter grade or more. Through this unique tool, *Life-Span Development* gives instructors the ability to identify struggling students quickly and easily, *before* the first exam.

Connect Psychology's adaptive diagnostic tool develops an individualized learning plan for every student. Confidence levels tailor the



Identify the lobes of the brain using the colors depicted in the picture of the brain.

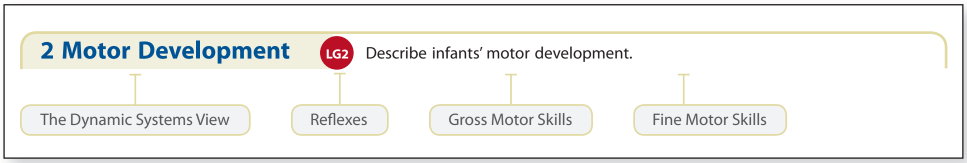
next question to each individual, helping students to identify what they don't know. If a student is doing well, the adaptive diagnostic tool will challenge the student with more applied and conceptual questions. If the student is struggling, the system identifies problem areas and directs the student to the exact page they need to read. In doing so, it works like a GPS, helping students master key concepts efficiently and effectively.

Regardless of individual study habits, preparation, and approaches to the course, students will find that *Life-Span Development* connects with them on a personal, individual basis and provides a road map for success in the course.

The Learning Goals System

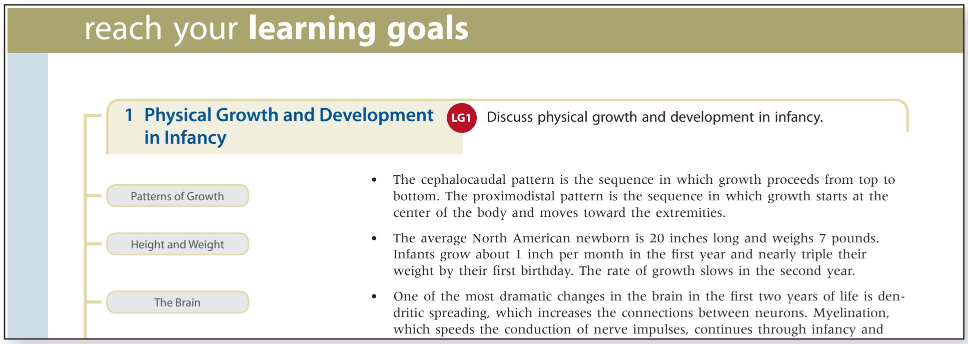
My students often report the lifespan development course to be challenging because of the amount of material covered. To help today's students focus on the key ideas, the Learning Goals System I developed for *Life-Span Development* provides extensive learning connections throughout the chapters. The learning system connects the chapter opening outline, learning goals for the chapter, mini-chapter maps that open each main section of the chapter, *Review, Connect, and Reflect* at the end of each main section, and the chapter summary at the end of each chapter.

The learning system keeps the key ideas in front of the student from the beginning to the end of the chapter. The main headings of each chapter correspond to the learning goals, which are presented in the chapter-opening spread. Mini-chapter maps that link up with the learning goals are presented at the beginning of each major section in the chapter.



2 Motor Development LG2 Describe infants' motor development.

- The Dynamic Systems View
- Reflexes
- Gross Motor Skills
- Fine Motor Skills



reach your **learning goals**

1 Physical Growth and Development in Infancy LG1 Discuss physical growth and development in infancy.

Patterns of Growth
- The cephalocaudal pattern is the sequence in which growth proceeds from top to bottom. The proximodistal pattern is the sequence in which growth starts at the center of the body and moves toward the extremities.

Height and Weight
- The average North American newborn is 20 inches long and weighs 7 pounds. Infants grow about 1 inch per month in the first year and nearly triple their weight by their first birthday. The rate of growth slows in the second year.

The Brain
- One of the most dramatic changes in the brain in the first two years of life is dendritic spreading, which increases the connections between neurons. Myelination, which speeds the conduction of nerve impulses, continues through infancy and

Then, at the end of each main section of a chapter, the learning goal is repeated in *Review, Connect, and Reflect,* which prompts students to review the key topics in the section, connect to existing knowledge, and relate what they learned to their own personal journey through life. *Reach Your Learning Goals*, at the end of the chapter, guides students through the bulleted chapter review, connecting with the chapter outline/learning goals at the beginning of the chapter and the *Review, Connect, and Reflect* at the end of major chapter sections.

Connecting Research to What We Know about Development

Over the years, it has been important for me to include the most up to date research available. I continue that tradition in this 13th edition, by looking closely at specific areas of research, involving experts in related fields, and updating research throughout. **Connections through Research,** formerly *Research in Life-Span Development*, describes a study or program to illustrate how research in lifespan development is conducted and how it influences our understanding of the discipline. Topics range from *Do Children*

Conceived through In Vitro Fertilization Show Significant Differences in Developmental Outcomes in Adolescence? (Ch 2) to *How Much Does the Environment Affect Intelligence?* (Ch 9) to *What is the Relationship Between Fitness in Young Adults and Cardiovascular Health in Middle Age?* (Ch 15).

The tradition of obtaining detailed, extensive input from a number of leading experts in different areas of lifespan development also continues in this edition. Biographies and photographs of the leading experts in the field of lifespan development appear on pages xvi to xviii, and the chapter-by-chapter highlights of new research content are listed on pages xxii to xxxvi. Finally, the research discussions have been updated in every period and topic. I expended every effort to make this edition of *Life-Span Development* as contemporary and up-to-date as possible. To that end, there are more than 1000 citations from 2009, 2010, and 2011 in the text.

connecting **through research**

How Much Does Environment Affect Intelligence?

Each morning a young mother waited with her child for the bus that would take the child to school. The child was only 2 months old, and "school" was an experimental program at the University of North Carolina at Chapel Hill. There the child experienced a number of interventions designed to improve her intellectual development—everything from bright objects dangled in front of her eyes while she was a baby to language instruction and counting activities when she was a toddler (Wickelgren, 1999). The child's mother had an IQ of 40 and could not read signs or determine how much change she should receive from a cashier. Her grandmother had a similarly low IQ.

Today, at age 20, the child's IQ measures 80 points higher than her mother's did when the child was 2 months old. Not everyone agrees that IQ can be affected this extensively, but environment can make a substantial difference in a child's intelligence. As behavior geneticist Robert Plomin (1999) says, even something that is highly heritable (like intelligence) may be malleable through interventions.

The child we just described was part of the Abecedarian Intervention program at the University of North Carolina at Chapel Hill conducted by Craig Ramey and his associates (Ramey & Campbell, 1984; Ramey & Ramey, 1998; Ramey, Ramey, & Lanzi, 2001). They randomly assigned 111 young children from low-income, poorly educated families to either an intervention group, which received full-time, year-round child care along with medical and social work services, or to a control group, which received medical and social benefits but no child care. The child-care program included game-like learning activities aimed at improving language, motor, social, and cognitive skills.

The success of the program in improving IQ was evident by the time the children were 3 years old. At that age, the experimental group showed normal IQs averaging 101, a 17-point advantage over the control group. Recent follow-up results suggest that the effects are long-lasting. More than a decade later at age 15, children from the intervention group still maintained an IQ advantage of 5 points over the control-group children (97.7 to 92.6) (Campbell & others, 2001; Ramey, Ramey, & Lanzi, 2001). They also did better on standardized tests of reading and math, and were less likely to be held back a year in school. Also, the greatest IQ gains were made by the children whose mothers had especially low IQs—below 70. At age 15, these children showed a 10-point IQ advantage over a group of children whose mothers' IQs were below 70 but did not experience the child-care intervention.

This research reinforces the research mentioned earlier that found prevention rather than remediation is important in counteracting a deprived early environment's effect on intelligence. It also supports the conclusion that modifications in environment can change IQ scores considerably. Therefore, it is important to consider the types of environments we provide for children—both those in the general population and those with disabilities (Waber, 2010).

Connecting Developmental Processes

Development through the lifespan is a long journey and too often we forget or fail to notice the many connections from one point in development to another. I have substantially increased these connections made in the text narrative. I also created two new features to help students connect topics across the periods of development.

Developmental Connections, which appears multiple times in each chapter, points readers to where the topic is discussed in a previous or subsequent chapter. *Developmental Connections* highlights links across age periods of development *and* connections between biological, cognitive, and socioemotional processes. These key developmental processes are typically discussed in isolation from each other and students often fail to see their connections. Included in the *Developmental Connections* is a brief description of the backward or forward connection. For example, consider the development of the brain. In recent editions, I have significantly expanded content on the changes in the brain through the life span, including new coverage of changes in the brain during prenatal development and an expanded discussion of the aging brain in older adults. The prenatal brain discussion appears in Chapter 3 and the aging brain material is described in Chapter 17. An important brain topic that we discuss in chapters 3 and 17 is neurogenesis, the production of new neurons. In this new edition, connections between these topics in chapters 3 and 17 are highlighted through *Developmental Connections*.

developmental **connection**

Brain Development. At birth, infants' brains weigh approximately 25 percent of what they will when adulthood is reached. Chapter 4, p. 114

developmental **connection**

Brain Development. At the peak of neurogenesis early in prenatal development, it is estimated that as many as 200,000 neurons are being generated every minute. Chapter 3, p. 85

Topical Connections: Looking Back and ***Looking Forward*** begin and conclude each chapter by placing the chapter's coverage in the larger context of development. The *Looking Back* section reminds the reader of what happened developmentally in the previous age stage.

Looking Forward prepares the student for what is to happen in the next age stage. Together, these new features help students construct a topical understanding of development alongside a chronological one.

topical **connections**

In the previous chapter, we followed the physical development that takes place from fertilization through the germinal, embryonic, and fetal periods of prenatal development. We learned that by the time the fetus has reached full gestational age (approximately 40 weeks), it has grown from a fertilized egg, barely visible to the human eye, to a fully formed human of approximately 7½ pounds and 20 inches in length. Also remarkable, by the end of the prenatal period the brain has developed approximately 100 billion neurons.

looking ***back***

topical **connections**

In the next chapter, you will read about the remarkable cognitive changes that characterize infant development and how early infants competently process information about their world. Advances in infants' cognitive development—together with the development of the brain and perceptual-motor advances discussed in this chapter—allow infants to adapt more effectively to their environment. In Chapter 7, we will further explore physical development when we examine how children progress through the early childhood years (ages 2 to 5). Young children's physical development continues to change and become more coordinated in early childhood, although gains in height and weight are not as dramatic in early childhood as in infancy.

looking ***forward***

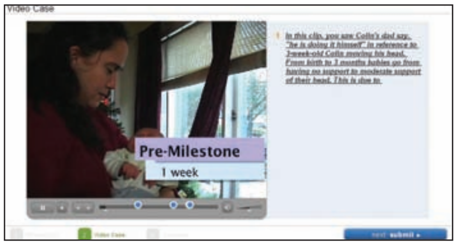
Finally, a new *Connect* question has been added to the section self-reviews—*Review, Connect, and Reflect*—so students can practice making connections between topics. For example, in Chapter 9, students are asked to connect what they learned in Chapter 7 about the link of genetics to autism, to what they just read about specific brain abnormalities associated with autism spectrum disorders.

Connect

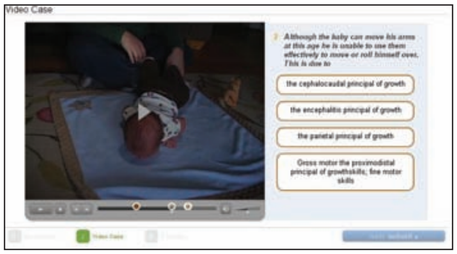
- In Chapters 5 and 7, you learned about the development of attention in infancy and early childhood. How might ADHD be linked to earlier attention difficulties in infancy and early childhood?

Connecting Development to the Real World

In addition to helping students make research and developmental connections, *Life-Span Development* shows the important connections between the concepts discussed and the real world. In recent years, students in my lifespan development course have increasingly told me that they want more of this type of information. In this edition, real life connections are explicitly made through the chapter opening vignette, *Connecting Development to Life*, the new Milestone program that helps students watch life as it unfolds, and *Connecting With Careers*.



1 *In this clip, you saw Colin's dad say, "he is doing it himself" in reference to 3-week-old Colin moving his head. From birth to 3 months babies go from having no support to moderate support of their head. This is due to*



2 *Although the baby can move his arms at this age he is unable to use them effectively to move or roll himself over. This is due to*

the cephalocaudal principal of growth

the encephalitis principal of growth

the parietal principal of growth

Gross motor the proximodistal principal of growthskills; fine motor skills

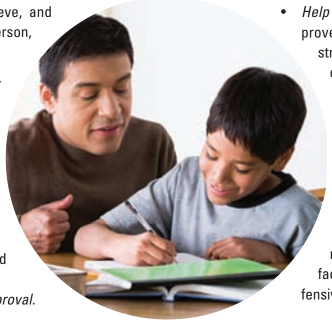
Video Case
Post-Milestone
15 weeks
Video Case
next submit ▸

connecting development to life

Increasing Children's Self-Esteem

Four ways children's self-esteem can be improved include identifying the causes of low self-esteem, providing emotional support and social approval, helping children achieve, and helping children cope (Bednar, Wells, & Peterson, 1995; Harter, 2006).

- *Identify the causes of low self-esteem.* Intervention should target the causes of low self-esteem. Children have the highest self-esteem when they perform competently in domains that are important to them. Therefore, children should be encouraged to identify and value areas of competence. These areas might include academic skills, athletic skills, physical attractiveness, and social acceptance.
- *Provide emotional support and social approval.* Some children with low self-esteem come from conflicted families or conditions in which they experienced abuse or neglect—situations in which support was not available. In some cases, alternative sources of support can be arranged either informally through the encouragement of a teacher, a coach, or another significant adult, or more formally through programs such as Big Brothers Big Sisters.
- *Help children achieve.* Achievement also can improve children's self-esteem. For example, the straightforward teaching of real skills to children often results in increased achievement and, thus, in enhanced self-esteem. Children develop higher self-esteem because they know the important tasks that will achieve their goals, and they have performed them or similar behaviors in the past.
- *Help children cope.* Self-esteem is often increased when children face a problem and try to cope with it, rather than avoid it. If coping rather than avoidance prevails, children often face problems realistically, honestly, and nondefensively. This produces favorable self-evaluative thoughts, which lead to the self-generated approval that raises self-esteem.



How can parents help children develop higher self-esteem?

Discussed in the "Emotional Development" section of Chapter 8, which parenting approach might help accomplish the last goal mentioned here? How?

Each chapter begins with a story designed to increase students' interest and motivation to read the chapter.

Connecting Development to Life, formerly *Applications in Life-Span Development*, describes the influence of development in a real world context on topics including From Waterbirth to Music Therapy (Ch 3), Increasing Children's Self-Esteem (Ch 10), and Health-care Providers and Older Adults (Ch 17). As will be seen later in the chapter-by-chapter changes, I created a number of new *Connecting Development to Life* interludes for this edition, as well as significantly updated and expanded applied topics in many areas of lifespan development.

The ***Milestones*** program shows students what developmental concepts look like by watching actual human's develop. Starting from infancy, students track several individuals, seeing them achieve major developmental milestones, both physically and cognitively. Clips continue through adolescence and adulthood, capturing attitudes toward issues such as family, sexuality, and death and dying.

Connecting With Careers, formerly *Careers in Life-Span Development*, profiles careers range from an educational psychologist (Ch 1) to a marriage and family therapist (Ch 8) to a perinatal nurse (Ch 3), which require a knowledge of human development.

The careers highlighted extend from the Careers Appendix in Chapter 1 that provides a comprehensive overview of careers in lifespan development to show students where knowledge of human development could lead them.

Part of applying development to the real world is understanding how it impacts one's self. One of my goals of my lifespan development course and this text is to motivate students to think deeply about their own journey of life. In reflecting about ways to further encourage students to make personal connections to content in the text, I added a R*eflect: Your Own Personal Journey of Life* prompt in the end-of-section review. This question asks students to reflect on some aspect of the discussion in the section they have just read and connect it to their own life. For example, in Chapter 1, students are asked:

Do you think there is, was/will be a best age for you to be? If so, what is it? Why?

I always include this question in the first content lecture I give in lifespan development and it generates thoughtful and interesting class discussion. Earlier in that section of Chapter 1 is a research discussion on whether there is a best age to be, which includes a recent large-scale research study on the topic. In addition, students are asked a number of personal connections questions in the photograph captions.

connecting with careers

Darla Botkin, Marriage and Family Therapist

Darla Botkin is a marriage and family therapist who teaches, conducts research, and engages in marriage and family therapy. She is on the faculty of the University of Kentucky. Botkin obtained a bachelor's degree in elementary education with a concentration in special education and then went on to receive a master's degree in early childhood education. She spent the next six years working with children and their families in a variety of settings, including child care, elementary school, and Head Start. These experiences led Botkin to recognize the interdependence of the developmental settings that children and their parents experience (such as home, school, and work). She returned to graduate school and obtained a Ph.D. in family studies from the University of Tennessee. She then became a faculty member in the Family Studies program at the University of Kentucky. Completing further coursework and clinical training in marriage and family therapy, she became certified as a marriage and family therapist.

Botkin's current interests include working with young children in family therapy, gender and ethnic issues in family therapy, and the role of spirituality in family wellness.

Darla Botkin (*left*), conducting a family therapy session.

For more information about what marriage and family therapists do, see page 48 in the Careers in Life-Span Development appendix.

Content Revisions

For the new edition, I removed the *Diversity in Life-Span Development* interludes and reworked the material into the main text. A number of adopters and reviewers indicated that they prefer to have diversity discussed in the natural flow of the text rather than in a boxed feature. I also updated and expanded a number of diversity topics (incorporated below). Following are the main chapter-by-chapter changes that were made in this new edition of *Life-Span Development*.

Chapter 1: Introduction

- Substantial updating of research and citations
- Extensive editing for improved student understanding
- New description of the life of 17-year-old Dolly Akter and her efforts to improve the lives of females in the slum where she lives in Dhaka, Bangladesh
- Expanded discussion of poverty and children, including updated statistics on the percentage of U.S. children under 18 years of age living in poverty (Federal Interagency Forum on Child and Family Statistics, 2008)
- Updated information about the Minnesota Family Investment Program (2009) including coverage of a current study that is examining the influence of specific family services on families at high risk for engaging in child maltreatment
- New coverage of resilience in development, including new Figure 1.5 that summarizes the characteristics of familial and extrafamiliar context that are linked with children's resiliency(Masten, 2007; Masten & others, 2008)
- New section, Connecting Biological, Cognitive, and Socioemotional processes (Diamond, 2009; Diamond, Casey, & Munakata, 2011)
- New description of the rapidly emerging fields of developmental cognitive neuroscience and developmental social neuroscience to illustrate the interface of biological, cognitive, and socioemotional processes (Calkins & Bell, 2010; Diamond, Casey, & Munakata, 2011)
- New section, Developmental Connections Across Periods of Development, including information about how students are guided to these connections throughout the text
- Inclusion of study on conscientiousness as a predictor of mortality risk from childhood through late adulthood to illustrate psychological aging (Martin, Friedman, & Schwarz, 2007)
- Expanded coverage of Bronfenbrenner's contributions (Gauvain & Parke, 2010)
- New Research Connections in Life-Span Development interlude: Research Journals

Chapter 2: Biological Beginnings

- Extensive updating of citations and research
- Inclusion of changes based on leading expert Kirby Deater-Deakard's recommendations
- Expanded discussion of criticisms of evolutionary psychology to include it being on a time scale that does not allow its empirical study
- New introductory material connecting the discussion of evolution and genetics
- New coverage of susceptibility and longevity genes (Marques, Markus, & Morris, 2010; Tacutu, Budovsky, & Fraifeld, 2010)
- New material on the concept of gene-gene interaction (Chen & others, 2009; Jylhava & others, 2009)
- Coverage of a recent within-family design of families with a biological child and an adopted child indicating only a slight trend in more internalized and externalized problems for adopted children (Glover & others, 2010)
- Description of epigenetic research on early rearing experiences and their alteration of gene expression with that expression being linked to later behavior (Pauli-Pott & others, 2009)
- Inclusion of information based on a recent research review of the main risk factors in the future health of babies born through assisted reproduction techniques (Basatemur & Sutcliffe, 2008)
- Updated and expanded discussion of heredity-environment interaction (Barry, Kochanska, & Philibert, 2008; Shen, 2009)
- New section and coverage of the concept of *G* × *E*, which involves the interaction of a specific measured variation in the DNA sequence and a specific measured aspect of the environment (Cheok & others, 2009; Diamond, 2009; Risch & others, 2009)
- Discussion of a recent G × E interaction study on the gene 5-HTTLPR and how the short version of the gene likely serves a protective function in children's parental loss (Caspers & others, 2009)
- New coverage of the field of *pharmacogenetics* and how it reflects *G* × *E* (Berlin, Paul, & Vesell, 2009; Lima & others, 2009)
- New final paragraph on the interaction of heredity and environment interaction with a connection to the discussion of development as a co-construction of biology, culture, and the individual

Chapter 3: Prenatal Development and Birth

- Coverage of recent research indicating that both maternal diabetes and obesity place the fetus at risk for developing neural tube defects (McQuire, Dyson, & Renfrew, 2010; Yazdy & others, 2010)

- New description of what the field of behavioral teratology involves
- New commentary about male fetuses being affected far more by teratogens than female fetuses
- New discussion of the effects of antidepressant use by pregnant women on their offspring, including recent research (Simoncelli, Martin, & Beard, 2010; Yonkers & others, 2009)
- Updated research on low-dose aspirin during pregnancy and child outcomes(Marret & others, 2010)
- Description of recent research on impaired memory development in children with FASD (Pei & others, 2008) and adults with FASD (Coles & others, 2010)
- Discussion of a recent study indicating that children with FASD have impaired math skills that are linked to a number of brain regions (Lebel & others, 2010)
- Addition of cardiovascular problems to the list of problems of offspring whose mothers smoked during pregnancy (Feng & others, 2010)
- Description of recent research on maternal smoking and inattention/hyperactivity in children (Knopik, 2009; Pinkhardt & others, 2009)
- Inclusion of recent research on cocaine use during pregnancy and children's deficits in behavioral self-regulation and sustained attention (Ackerman, Riggins, & Black, 2010)
- Coverage of a recent study linking prenatal cocaine exposure to an increased likelihood of being in special education and receiving support services (Levine & others, 2008)
- Description of recent research on prenatal methamphetamine exposure and memory deficits in childhood (Lu & others, 2009)
- Discussion of recent research indicating that toddlers of mothers who did not take folic acid supplements in the first trimester of pregnancy had more behavior problems (Roza & others, 2010).
- Updated and expanded material on the offspring of diabetic mothers (Gluck & others, 2009; Eriksson, 2009)
- New discussion of a recent study on maternal depression and its link to negative prenatal and birth outcomes (Diego & others, 2009)
- Coverage of recent research on the positive effects of massage therapy in reducing pain in pregnant women, alleviating prenatal depression in both parents, and improving their relationship (Field & others, 2008)
- Description of a recent study indicating positive benefits in CenteringPregnancy groups (Klima & others, 2009)
- Discussion of recent research on a home visitation program that reduced the incidence of low birth weight infants (Lee & others, 2009)
- Updated figures on the increasing number of preterm births in the U.S. (National Center for Health Statistics, 2009)
- Updated research on hypnosis and childbirth (Abbasi & others, 2010)
- Coverage of a recent study of the NNNS at 1 month of age and its ability to predict certain developmental outcomes at 4.5 years of age (Liu & others, 2010)
- Significant updating of research on the role of progestin in preventing preterm births, indicating the conditions under which progestin in most successful (da Fonseca & others, 2009; Norman & others, 2009; Rode & others, 2009)
- Discussion of a recent research study indicating that exercise in pregnancy was linked to a reduced risk of preterm birth (Hegaard & others, 2008)
- Discussion of a recent study on the percent of women with postpartum depression who seek help for their depression (McGarry & others, 2009)
- Coverage of a recent research review of the interaction difficulties of depressed mothers and their infants (Field, 2010)
- New Connecting With Careers profile: Diane Sanford, Clinical Psychologist and Post-Partum Expert
- Updated coverage of fathers' adjustment during the postpartum period (Dietz & others, 2009; Smith & Howard, 2008)
- Discussion of a recent study linking paternal postpartum depression with children's psychological disorders seven years later (Ramchandani & others, 2008).

Chapter 4: Physical Development in Infancy

- Updated coverage of the development of the brain based on expert consultant Martha Ann Bell's feedback
- Extensive updating and expanded discussion of key aspects of perceptual development based on leading expert Scott Johnson's (2009, 2010a, b) views
- New material on which individuals are most often the perpetrators of shaken baby syndrome (National Center for Shaken Baby Syndrome, 2009)
- Description of a recent study on right hemisphere dominance of language in children with perinatal brain damage to the left hemisphere (Guzzetta & others, 2008)
- Updated and expanded material on sleep patterns in infancy (Sadeh, 2008)
- Description of results from two studies on shared sleeping in African American and non-Latino White families (Fu & others, 2008; Hauck & others, 2008)
- Coverage of a recent study indicating that more than one-fourth of U.S. mothers did not use the recommended supine position for infant sleep (Hauck & others, 2008)
- Coverage of a recent study indicating that infants who sleep in bedrooms with a fan have a lower risk of SIDS (Coleman-Phox, Odouli, & Li, 2008)

- Expanded coverage of developmental changes in infants' eating patterns (Black & Hurley, 2007; Black & Lozoff, 2008; Chatoor & Macoay, 2008)
- Inclusion of information from a recent research review on breast feeding (Ip & others, 2009)
- Discussion of two recent studies that illustrate the influence of malnutrition on infants' and young children's cognitive development (Kar, Rao, & Chandramouli, 2008; Nahar & others, 2008)
- New Connecting Development to Life interlude: Improving the Nutrition of Mothers, infants, and Young Children in Low-Income Families
- Recent information about changes in the WIC program for 2009 (Food & Nutrition, Service, 2009)
- Inclusion of recent research on the changes and effectiveness of various aspects of the WIC program (Black & others, 2009; Heinig & others, 2009; Olson & others, 2009a, b)
- Coverage of a recent study illustrating the influence of visual information on 3-day-old infants' stepping actions (Barbu-Roth & others, 2009)
- Description of recent research on infants' walking patterns and their occasional large steps (Badaly & Adolph, 2008)
- Discussion of a recent research review that found no link between breast feeding and the quality of the mother-infant relationship (Jansen, de Weerth, & Riksen-Walraven, 2008)
- Updated coverage of cultural variation in infant motor development (Adolph, Karasik, & Tamis-LeMonda, 2010)
- Coverage of a recent study of infants' eye movements while watching an animated film indicating an increase in focusing on faces from 3- to 9-months of age and a decrease in looking at salient background stimuli (Frank & Johnson, 2009)
- Inclusion of recent information about the development of sophisticated eye-tracking equipment to study infant perception (Franchak & others, 2010), including new Figure 4.19 that shows a baby wearing eye-tracking headgear
- Deletion of figure on eye tracking (Banks & Salapatek, 1983) because it was done a number of years ago with rudimentary equipment and does not accurately portray newborns' eye movements
- New section on the perception of occluded objects
- New material on the age at which infants develop the ability to perceive that occluded objects are complete
- Discussion of Scott Johnson's (2009, 2010a, b) view on why infants are able to develop the ability to perceive occluded objects as complete
- New description of a recent study by Bennett Bertenthal and his colleagues (2007) on infants' predictive tracking of briefly occluded moving objects, including new figure 4.21
- New commentary about critics of the visual cliff concluding that it likely is a better test of social referencing and fear of heights than depth perception
- New main section, Nature, Nurture, and Perceptual Development that examines nativist and empiricist views of perception (Aslin, 2009; Johnson, 2009, 2010a, b; Slater & others, 2010)
- Updated and expanded coverage of perceptual-motor coupling, including how infants develop new perceptual-motor couplings

Chapter 5: Cognitive Development in Infancy

- New section on the nature/nurture issue in infant cognitive development
- New discussion of Elizabeth Spelke's (2000, 2003; Spelke & Kinzler, 2007; 2009) core knowledge approach
- New coverage of the intriguing question of whether young infants have a sense of number (de Hevia & Spelke, 2010; Izard & Spelke, 2010)
- Description of a recent study on the area of the brain activated when 3-month-old infants were observing changes in the number of objects compared to changes in the type of objects (Izard, Dehaene-Lambertz, & Dehaene, 2008)
- New discussion of Baillargeon's (2008; Baillargeon & others, 2009) innate bias view as expressed in the principle of persistence
- Inclusion of criticism of Spelke's core knowledge approach by Mark Johnson (2008)
- Expanded and updated conclusion to what the focus and most difficult task infant researchers face in determining the influence of nature and nurture (Aslin, 2009)
- New Figure 5.7 that summarizes how long researchers have found infants of different ages can remember information (Bauer, 2009)
- Expanded discussion of concept formation and categorization in infancy and new final summary statement about the infant's remarkable degree of learning power (Diamond, Casey, & Munakata, 2011; Mandler, 2004, 2009)
- Expanded and updated coverage of predicting children's intelligence from assessment of habituation in early infancy (Domsch, Lohaus, & Thomas, 2009)
- Modifications and updates of the discussion of language development in infancy based on leading expert Barbara Pan's comments
- Expanded definition of language to include words used by a community and the rules for combining and using them appropriately
- Discussion of recent research on differences in early gesture as explanations for SES disparities in child vocabulary at school entry (Rowe & Goldin-Meadow, 2009b)
- New material on shared book reading and its benefits for infants and toddlers (Barbarin & Aikens, 2009; Rodriguez, Hines, & Montiel, 2008)

Chapter 6: Socioemotional Development in Infancy

- Added commentary about the importance of the communication aspect of emotion, especially in infancy (Campos, 2009)
- Expanded coverage of the onset of emotions in infancy, including Jerome Kagan's (2010) recent conclusion that emotions such as guilt, pride, despair, shame, and jealousy, which require thought, cannot be experienced in the first year because of the structural immaturity of the infant's brain
- New material on the importance of smiling in infancy as a means of developing a new social skill and being a key social signal (Campos, 2009)
- New discussion of anticipatory smiling in infancy and its link to social competence in early childhood (Parlade & others, 2009)
- Revised definition of temperament to include individual differences in emotions based on leading expert Joseph Campos (2009) view
- Updated coverage of temperament based on feedback from leading expert John Bates
- Description of a recent study indicating an interaction between temperament style and the type of child care young children experience (Pluess & Belsky, 2009)
- New material on the importance of considering the multiple temperament dimensions of children rather than classifying them on a single dimension (Bates, 2008)
- New coverage of cultural variations in toddlers' mirror self-recognition and information about physical self-recognition as possibly being more important in toddlers from Western than non-Western cultures (Keller & others, 2005; Thompson & Virmani, 2010)
- Coverage of a recent meta-analysis of studies using the still-face paradigm and links between affect and secure attachment (Mesman, van IJzendoorn, & Bakersman-Kranenburg, 2009)
- Added commentary about the importance of locomotion for the development of independence in the infant and toddler years (Campos, 2009)
- Description of a recent study linking security of attachment at 24 and 36 months to the child's social problem solving skills at 54 months (Raike & Thompson, 2009)
- Discussion of a recent study of maternal sensitive parenting and infant attachment security (Finger & others, 2009)
- Coverage of a recent meta-analysis linking three types of insecure attachment to externalizing problems (Fearon & others, 2010)
- Added information about the link of maternal sensitivity to secure infant attachment not being especially strong (Campos, 2009)
- Description of recent research indicating a gene x environment interaction between disorganized attachment, the short version of the serontonin transporter gene—5-HTTLPR—and a low level of maternal responsiveness (Spangler, 2009)
- New coverage of the Aka pygmy culture, where fathers are as involved in infant caregiving as much as mothers are (Hewlett, 2000; Hewlett & MacFarlan, 2010)
- Description of a recent study of multiple child-care arrangements and young children's behavioral outcomes (Morrissey, 2009)
- Expanded and updated material on the important role of sensitive parenting in child outcomes for children in child care (Friedman, Melhuish, & Hill, 2010; Thompson, 2009)

Chapter 7: Physical and Cognitive Development in Early Childhood

- New main section on young children's sleep
- Description of young children's sleep requirements (National Sleep Foundation, 2008)
- Description of recent longitudinal study on characteristics linked to young children having bad dreams (Simard & others, 2008)
- Inclusion of recent research on bedtime sleep resistance and problem behaviors in children (Carvalho Bos & others, 2008)
- Description of recent research on short sleep duration and being overweight in childhood (Nielson, Danielson, & Sorensen, 2010; Nixon & others, 2008)
- Discussion of a recent study linking sleep problems from 3 to 8 years of age with the early onset of drug use and depression in adolescence (Wong, Brower, & Zucker, 2009)
- Coverage of a recent national study of trends in children's meals eaten outside the home and the percentage of children's meals that exceed the recommended amount of saturated fat and trans fat (Center for Science in the Public Interest, 2008)
- Inclusion of a recent study that found children's weight at five years of age was significantly related to their weight at nine years of age (Gardner & others, 2009)
- Discussion of a recent study on developmental changes in the percentage of overweight children from 4 to 11 years of age depending on whether they have lean or obese parents (Semmler & others, 2009)
- Description of a recent study of preschool children's percentage of time spent in sedentary behavior and light to vigorous physical activity (Brown & others, 2009)
- Coverage of a recent study linking young children's exposure to second-hand smoke to sleep problems, including sleep-disordered breathing (Yolton & others, 2010)
- Much expanded and updated coverage of lead poisoning in children and its outcomes (Bellinger, 2008; Canfield & Jusko, 2008)

- Coverage of recent research on the effectiveness of the Tools of the Mind curriculum to improve at-risk young children's self-regulatory and cognitive control skills (Diamond & others, 2007)
- New material on using computer exercises to improve children's attention (Jaeggi, Berman, & Jonides, 2009; Tang & Posner, 2009)
- Discussion of a recent study that linked children's attention problems at 54 months of age with a lower level of social skills in peer relations in the first and third grades (NICHD Early Child Care Research Network, 2009)
- Description of a recent study on young children's narrative ability and resistance to suggestion (Kulkofsky & Klemfuss, 2008)
- New Research on Life-Span Development interlude: Theory of Mind and Autism
- Expanded discussion of emergent literacy skills in young children including a recent study linking maternal education with emergent literacy skills (Korat, 2009)
- Coverage of a recent study of key factors in young children's early literacy experiences in low-income families (Rodriguez & others, 2009)
- Description of a recent longitudinal study linking early home environment with early language skills, which in turn predicted school readiness (Forget-Dubois & others, 2009)
- Inclusion of NAEYC's (2009) extensively revised and updated guidelines for developmentally appropriate practice, including new Figure 7.17 (NAEYC, 2009)
- Expanded and updated discussion of developmental appropriate education's characteristics and goals (Barbarin & Miller, 2009)
- New discussion of the Early Head Start program (Administration for Children & Families, 2008)
- New coverage of recent studies of the influence of Project Head Start on children's cognitive, language, and math skills and achievement (Hindman & others, 2010; Puma & others, 2010)

Chapter 8: Socioemotional Development in Early Childhood

- New coverage of leading expert Ross Thompson's (2009b) commentary about how current research on theory of mind and young children's social understanding is so dissonant with Piaget's egocentrism concept
- Description of recent research on young children's understanding of joint commitments (Grafenhain & others, 2009)
- Reorganization of the discussion of emotional development into these categories based on expert Susan Denham's recommendation: Expressing emotions, understanding emotions, and regulating emotions
- Expanded discussion of advances in young children's understanding of emotions (Cole & others, 2009)
- Coverage of a recent meta-analysis indicating that emotion knowledge was positively linked to 3- to 5-year-old's social competence and negatively related to their internalizing and externalizing problems (Trentacosta & Fine, 2009)
- Discussion of a recent study linking young children's emotion understanding with their prosocial behavior (Ensor, Spencer, & Hughes, 2010)
- New Connecting Through Research interlude: Linking Specific Components of Parenting to Specific Emotions in Young Children (Davidoff & Grusec, 2006)
- Coverage of recent study linking an early mutually responsive orientation between parents and their infant, a decrease in power assertive discipline in early childhood, and an increase in the young child's internalization and self-regulation (Kochanska & others, 2008)
- Updated description of gender identity (Blakemore, Berenbaum, & Liben, 2009; Egan & Perry, 2001)
- Discussion of a recent study on developmental changes in sex-typed behavior (Golombok & others, 2008)
- Coverage of a recent study linking higher prenatal testosterone levels to increased male-typical play in 6- to 10-year-old boys and girls (Auyeung & others, 2009)
- New material on caution in interpreting studies of parenting styles and children's development because they are correlational in nature
- Expanded discussion of the effects of punishment on children, including the current conclusion of some experts that adequate research evidence has not yet been obtained about the effects of abusive physical punishment and mild physical punishment
- Conclusions regarding punishment research that if physical punishment is used it needs to be mild, infrequent, age-appropriate, and used in the context of a positive parent-child relationship (Grusec, 2011)
- Updated child maltreatment statistics in the United States (U.S. Department of Health and Human Services, 2008)
- New material on adolescent outcomes of child abuse and neglect (Wekerle & others, 2009)
- Coverage of a recent study indicating the positive influence of coparenting on young children's effortful control (Karreman & others, 2008)
- New section on the early development of friendships during the preschool years (Howes, 2009)
- New section, The Connected Worlds of Parent-Child and Peer Relations (Hartup, 2009; Ross & Howe, 2009)
- Description of a recent study on parenting behaviors that are linked to children's social competence and social acceptance (McDowell & Parke, 2009)
- Enhanced and updated discussion of why pretend play is an important aspect of early childhood development (Copland & Arbeau, 2009)

- Coverage of recent research indicating that pretrend play increases young children's self-regulation (Diamond & others, 2007)
- Expanded and updated material on social play as the main context for most young children's interactions with peers (Copland & Arbeau, 2009)

Chapter 9: Physical and Cognitive Development in Middle and Late Childhood

- New discussion of Mark Johnson and his colleagues (2008) view on how the prefrontal cortex likely orchestrates the functioning of other neural regions during development
- Discussion of a recent study on parents' roles in limiting children's sedentary activity (Edwardson & Gorley, 2010)
- Description of a recent study on the effectiveness of a school-based program for increasing children's physical activity (Kriemer & others, 2010)
- Coverage of a recent study that revealed a positive role of aerobic exercise fitness on 9-year-old girls' performance on a cognitive control task that required them to inhibit irrelevant responses to obtain correct solutions (Hillman & others, 2009)
- Coverage of a recent large-scale U.S. study indicating a higher percentage of being overweight or obese for African American and Latino children than non-Latino White children (Benson, Baer, & Kaelber, 2009)
- New discussion of a recent national study indicating an increase in the percentage of U.S. children and adolescents with elevated blood pressure (Ostchega & others, 2009)
- Discussion of a recent research review on obesity and low self-esteem in children (Griffiths, Parsons, & Hill, 2010)
- Updated statistics on the percentage of children who receive special education services in the United States (National Center for Education Statistics, 2008a)
- New discussion of dysgraphia
- New coverage of dyscalculia
- New coverage of neurotransmitters, such as serotonin and dopamine, and their possible link to ADHD (Levy, 2009; Rondou & others, 2010; Zhou & others, 2010)
- Description of a recent meta-analysis indicating that behavior management treatments are effective in reducing the effects of ADHD (Fabiano, 2009)
- New section on emotional and behavioral disorders (Gargiulo, 2009; Kaufmann & Landrum, 2009)
- Significantly updated and expanded discussion of autism spectrum disorders (Anderson & others, 2009; Gong & others, 2009)
- New information about the recent increase in the estimate of the number of children with autistic spectrum disorders
- Expanded discussion of gender and autism, including Baron Cohen's (2008) argument that autism reflects an extreme male brain
- New material on recent research using animated faces and emotions to improve autistic children's ability to recognize faces, including new Figure 9. (Baron-Cohen & others, 2007)
- Expanded coverage of strategies for improving children's memory skills, including memory development expert Patricia Bauer's (2009) emphasis on the importance of consolidation and reconsolidation in memory through variation on an instructional theme and linking often
- New material on Peter Ornstein and his colleagues' view (Ornstein, Coffman, & Grammar, 2009; Ornstein & others, 2010) that it is important for instructors to embed memory-relevant language in their teaching
- New discussion of Ellen Langer's concept of mindfulness and its importance in critical thinking
- New material on the most recent revision of the Stanford Binet test, the Stanford-Binet 5, which now provides scores on 5 subtests and an overall composite score (Bart & Peterson, 2008)
- Added new conclusion to the section on heredity/environment and intelligence and tied the conclusion to the nature/nurture issue first discussed in Chapter 1
- New section, Nature/Nurture, in the discussion of giftedness
- New section, Domain-Specific Giftedness and Development
- New material on developmental changes in giftedness in childhood and adolescence with increased emphasis on domain-specific giftedness (Keating, 2009; Sternberg, 2010e)
- Inclusion of commentary by Bill Gates about domain-specific giftedness
- New coverage of Rich Mayer's (2008) conclusions on the three main cognitive processes that children need to go through in order to read a printed word
- New section, Writing, that highlights developmental changes in writing skills and highlights the key factors in helping children become better writers (Graham, 2009; Harris & others, 2009)
- Discussion of a recent meta-analysis that found four factors are critical in improving the writing quality of 4th through 12th grade students (Graham & Perin, 2007)
- Coverage of a recent research review indicating that bilingual children have lower formal language proficiency than monolingual children (Bialystok & Craik, 2010)
- New Connecting With Careers profile: Salavador Tamayo, Bilingual Education Teacher

Chapter 10: Socioemotional Development in Middle and Late Childhood

- Coverage of a recent study on the developmental increase in self-control in middle and late childhood and its link to lower levels of deviant behavior and to warmth and positive affect in parenting (Vazsonyi & Huang, 2010)

- Inclusion of a recent study of self-regulation in children from low-income families (Buckner, Mezzacappa, & Beardslee, 2009)
- Updated and expanded coverage of children's outcomes following a disaster (Kar, 2009)
- Updated conclusions about whether gender differences in moral orientation are as strong as Gilligan suggests (Blakemore, Berenbaum, & Liben, 2009)
- New commentary about boys' having more rigid gender stereotypes than girls (Blakemore, Berenbaum, & Liben, 2009)
- Coverage of a recent study of 3- to 10-year-old boys' and girls' gender stereotyping (Miller & others, 2009)
- New summary of sex differences in the brain emphasizing caution in interpreting differences (Blakemore, Berenbaum, & Liben, 2009)
- Added commentary that any sex differences in the brain could be due to biological origins of the differences, behavioral experiences, or a combination of these factors
- Coverage of recent large-scale assessment of a gender difference in writing (National Assessment of Educational Progress, 2007) and lack of a difference in math (Hyde & others, 2008)
- Discussion of a recent study indicating that relational aggression increases in middle and late childhood (Dishion & Piehler, 2009)
- Inclusion of information from a recent research review that girls engage in more relational aggression than boys in adolescence but not in childhood (Smith, Rose, & Schwartz-Mette, 2010)
- Description of a recent study linking parents' psychological control to a higher incidence of relational aggression in their children (Kuppens & others, 2009)
- Updated description of gender differences in emotion (Blakemore, Berenbaum, & Liben, 2009)
- Description of 3 recent suicides in middle and late childhood and early adolescence that likely were influenced by bullying (Meyers, 2010)
- New emphasis on the importance of contexts in the study of bullying (Salmivalli & others, 2009; Schwartz & others, 2010)
- Coverage of two recent studies of bullies' popularity in the peer group (Veenstra & others, 2010; Wivliet & others, 2010)
- Description of a recent study on peer victimization and the extent of its link to lower academic achievement (Nakamoto & Schwartz, 2010)
- New Connecting Through Research interlude: The Perspective Taking and Moral Motivation of Bullies, Bully-Victims, Victims, and Prosocial Children (Gasser & Keller, 2009)
- Description of a longitudinal study of children from 6 to 13 years of age linking lack of a reciprocal friendship to loneliness and depressed feelings in early adolescence (Pedersen & others, 2007)
- Coverage of a recent study on neighborhood disadvantage and child outcomes such as behavior problems and low verbal ability (Kohen & others, 2008)
- Description of a recent study linking chronic poverty to adverse cognitive development outcomes in children (Najman & others, 2009)
- New discussion of the recent results from the large-scale international assessment of 4th grade students' math and science scores with a focus on how U.S. students compare to students in other countries (National Center for Education Statistics, 2009)
- New coverage of Carol Dweck's recent research and ideas on improving students' growth mindset by teaching them about the brain's plasticity and how the brain changes when you put considerable effort into learning (Blackwell & others, 2007; Dweck & Master, 2009)
- New discussion of Carol Dweck's recent development of computer modules, called "Brainology," that explain how the brain works and how through work and effort students can make their brain work better (Blackwell & Dweck, 2008; Dweck & Master, 2009)

Chapter 11: Physical and Cognitive Development in Adolescence

- Coverage of a recent review by experts on trends in the earlier onset of pubertal development (Euling & others, 2008a)
- New discussion of precocious puberty (Blakemore, Berenbaum, & Liben, 2009)
- Inclusion of recent information that early maturing girls are less likely to graduate from high school and more likely to cohabit and marry earlier (Cavanagh, 2009)
- New discussion of the pruning of synapses and what this means by the end of adolescence (Kuhn, 2009)
- New description of how the information about changes in the adolescent brain reflect the rapidly emerging field of social developmental neuroscience (Johnson, 2009)
- Updated information about causes of adolescent deaths in the U.S. (National Vital Statistics Reports, 2008)
- Coverage of the reversal in increase of births to adolescents with a decline in 2007 and 2008, and new Figure 11.7 (Hamilton, Martin, & Ventura, 2010)
- Description of a recent study linking TV viewing of sex and adolescents girls' subsequent higher risk of pregnancy (Chandra & others, 2008)
- Discussion of a recent research review on adolescents, sex, and the media (Brown & Strasburger, 2007)
- Description of recent national study on the percentage of U.S. high school students who were currently sexually active (Eaton & others, 2008)

- Coverage of a recent study of adolescents' sexual experience and having multiple sexual partners from 1991 to 2007 (Santelli & others, 2009)
- Discussion of a recent study that linked alcohol use, early menarche, and poor parent-child communication to early sexually intimate behavior in girls (Hipwell & others, 2010)
- Description of recent research on parental monitoring in Latino families and adolescents' sexual activity (Allen & others, 2008)
- New section, Risk Factors in Adolescent Sexual Behavior
- Coverage of a recent study that revealed a link between maternal communication about sex and a reduction in risky sexual behavior by Latino adolescents (Trejos-Castillo & Vazaonyi, 2009)
- Coverage of a recent study of middle school students indicating that better academic achievement was a protective factor in keeping boys and girls from engaging in early initiation of sexual intercourse (Laflin & others, 2008)
- Coverage of recent studies that revealed higher condom use by European adolescents than U.S. adolescents (Currie & others, 2008; Santelli, Sandfort, & Orr, 2009)
- Description of recent national data on the U.S. adolescent birth rate, indicating an increase in 2006, including new figure of trends (Child Trends, 2008)
- Discussion of the high fertility rate of Latina adolescents and comparison of their recent adolescent pregnancy and birth rates with other ethnic groups (Santelli, Abraido-Lanza, & Melnikas, 2009)
- New coverage of information comparing ethnic groups on the likelihood of having a second child in adolescence (Rosengard, 2009)
- Description of a national study documenting the high percentage of daughters of teenage mothers who become pregnant themselves as teenagers, and other risk factors in the daughters' lives for becoming pregnant (Meade, Kershaw, & Ickovics, 2008)
- Updating of the trends in the percentage of U.S. adolescents who ate fruits and vegetables on a regular basis (Eaton & others, 2008)
- Discussion of a recent study on eating regular family meals and healthy eating patterns five years later (Burgess-Champoux & others, 2009)
- New description of a recent national study showing the low exercise rates of U.S. 15-year-olds (Nader & others, 2008)
- Updated coverage of ethnicity by gender rates of exercise for U.S. adolescents (Eaton & others, 2008)
- Coverage of a recent national study showing that 13 years of age is when a decline in exercise occurs in many adolescents and factors that increase the likelihood that adolescents will engage in regular exercise (Kahn & others, 2008)
- Description of a recent study on the positive effects of regular exercise in helping girls to maintain regular weight from 9 to 16 years of age (McMurray & others, 2008)
- New overview of the positive physical outcomes of regular exercise in adolescence (Butcher & others, 2008)
- Description of a recent physical activity intervention study that increased the self-image of adolescent girls (Schneider, Dunton, & Cooper, 2008)
- Inclusion of recent research on links between watching TV and using computers and exercise rates of adolescents (Chen, Liou, & Wu, 2008)
- Discussion of a recent study linking low levels of exercise to depressive symptoms in young adolescents (Sund, Larsson, & Wichstrom, 2010)
- Description of a recent study that found vigorous physical activity was related to lower drug use in adolescents (Delisle & others, 2010)
- Coverage of a recent national study of adolescent sleep patterns, including developmental changes from the 9th through the 12th grade, as well as a new figure illustrating the changes (Eaton & others, 2008)
- Updated coverage of the Monitoring the Future study's assessment of drug use by secondary school students (Johnston & others, 2010)
- New discussion of driving and drinking during adolescence, including recent data on this topic (Johnston & others, 2008)
- Coverage of recent research that found parental monitoring was linked to lower substance abuse in adolescence (Tobler & Komro, 2010)
- Description of a recent research review that indicated adolescents who more frequently ate dinner with their family were less likely to have various problems (Sen, 2010)
- Expanded coverage of the pruning of synapses and what this means by the end of adolescence (Kuhn, 2009)
- Revised coverage of the personal fable based on recent research that indicates many adolescents perceive that they will experience an early death (Fischhoff & others, 2010)
- Expanded introduction to information processing and thinking in adolescence based on Deanna Kuhn's (2009) recent view on differences in childhood and adolescent cognitive development
- New discussion of the dual-process model of adolescent decision making (Reyna & Rivers, 2008)
- New main section, Extracurricular Activities, that highlights the positive aspects of these activities on adolescent development (Fredricks & Eccles, 2010; Parente & Mahoney, 2009)
- Updated statistics on school dropouts, including the substantial decrease in Latino dropouts since 2000 (National Center for Education Statistics, 2008a)

Chapter 12: Socioemotional Development in Adolescence

- Discussion of the controversy about whether recent generations of adolescents and emerging adults are more narcissistic than earlier generations and recent research on this topic (Trzesniewski, Donnellan, & Robins, 2008a, b; Twenge & others, 2008a, b)
- Expanded and updated description of why college often stimulates a greater integration of identity at a higher level (Phinney, 2008)
- Coverage of a recent meta-analysis of 127 studies focused on developmental changes in Marcia's identity statuses (Francis, Fraser, & Marcia, 2010)
- Description of a recent longitudinal study of ethnic identity resolution and proactive coping with discrimination (Umana-Taylor & others, 2008)
- Discussion of a recent study of the implications of ethnic identity exploration for developing a secure sense of one's ethnic identity, which in turn was linked to a positive attitude toward one's own group and other groups (Whitehead & others, 2009)
- New material on gender differences in religion in adolescence (King & Roeser, 2009)
- Updated and expanded coverage of links between cognitive changes and adolescents' religious and spiritual development (Good & Willoughby, 2008)
- Major new section on the media and adolescent development
- New main section, Parental Monitoring
- New material on the role of adolescents' active role in managing parents' access to information about their whereabouts, activities, and friends (Daddsi & Randolph, 2010; Keijsers & Laird, 2010; Smetana & others, 2010)
- Inclusion of information about greater protection and monitoring of daughters than sons in Latino families compared to non-Latino White families (Allen & others, 2008)
- Discussion of Joseph Allen and his colleagues' (2009) recent research linking secure attachment at age 14 with positive outcomes at age 21
- New discussion of the talk-featured, gossip aspect of friendship in adolescence (Buhrmester & Chong, 2009)
- New Connecting Development to Life interlude: Effective and Ineffective Strategies for Making Friends
- Expanded and updated material on which adolescents are most likely to conform to their peers (Prinstein, 2007; Prinstein & Dodge, 2008; Prinstein & others, 2009)
- New discussion of developmental changes in the size of same-sex and opposite-sex friendships in cliques (Buhrmester & Chong, 2009)
- New coverage of three stages in the development of romantic relationships in adolescence (Connolly & McIsaac, 2009)
- New material on the percentage of adolescents who are early and late bloomers in developing romantic relationships (Connolly & McIsaac, 2009)
- Coverage of a recent study of adolescents' romantic experience and links to various aspects of adjustment (Furman, Lo, & Ho, 2009)
- Description of a recent study indicating that romantic involvement predicted an increase in depressive symptoms in adolescence (Starr & Davila, 2009)
- Coverage of a recent study of Chinese American 6th graders' discrimination by peers (Rivas-Drake, Hughes, & Way, 2008)
- New discussion of mentoring and the Quantum Opportunities Program for (Eisenhower Corporation, 2009)
- Expanded and updated coverage of the increase of adolescents' and emerging adults' reliance on digital mediation of their social environment (Roberts, Henrikson, & Foehr, 2009)
- Inclusion of recent research on the increased risk of a crash or near crash while text messaging based on videotaped behavior of drivers (Blanco & others, 2009; Hanowksi & others, 2009)
- New information about youths' communication with strangers on the Internet and cyberbulling (Subrahmanyam & Greenfield, 2008)
- Discussion of recent research on adolescent self-disclosure on the Internet and which gender benefits more from self-disclosing with friends on the Internet (Schouten, Valkenburg, & Peter, 2007; Valkenburg & Peter, 2009)
- Description of recent research linking friendship and behavioral adjustment in early adolescence to emerging adults' communication on social networking sites (Mikami & others, 2010)
- Updated statistics on trends in juvenile delinquency, including new Figure 12.7 (Puzzanchera & Sickmund, 2008)
- Coverage of a recent study linking parents' lack of knowledge of their young adolescents' whereabouts and the adolescents' engagement in delinquency later in adolescence (Lahey & others, 2008)
- Description of a recent study on the positive influence of school connectedness in lowering conduct problems in early adolescence (Loukas, Roalson, & Herrera 2010)
- Discussion of a recent study implicating harsh discipline at 8 to 10 of age as a predictor of which adolescent delinquents would persist in criminal activity after age 21 (Farrington, Ttofi, & Cold, 2009)
- Coverage of a recent longitudinal experimental study involving parenting intervention with divorced mothers and sons and a subsequent lower level of delinquency (Forgatch & others, 2009)
- Coverage of recent estimates of the incidence of depression in adolescence (Graber & Sontag, 2009)

- Discussion of a recent study of young adolescents' friendships and depression (Brendgen & others, 2010)
- Description of a recent study that found a link between peer victimization and suicide thoughts and attempts (Klomek & others, 2008)
- Inclusion of recent research on suicide attempts by young Latinas (Zayas & others, 2010)
- Description of a recent study using data from the National Longitudinal Study of Adolescent Health that found a number of risks for suicidal behavior (Thompson, Kuruwita, & Foster, 2009)
- Description of a recent study on alcohol, depression, and suicide attempts in adolescence (Schilling & others, 2009)

Chapter 13: Physical and Cognitive Development in Early Adulthood

- Discussion of a recent study of more than 17,000 young adults in 21 countries that focused on links between health behavior and life satisfaction (Grant, Wardle, & Steptoe, 2009)
- Updated coverage of overweight and obesity, including projections of the percentage of Americans who will be overweight in 2030 (Beydoun & Wang, 2009)
- Description of two recent studies of obese individuals with results indicating that engaging in regular exercise resulted in weight loss, which was linked to changes in levels of leptin (Nagashima & others, 2010; Rider & others, 2010)
- Inclusion of recent research on the link between overweight and depression (Ball, Burton, & Brown, 2009)
- Updated discussion of dieting including a recent research review of diet-plus-exercise in weight loss (Wu & others, 2009)
- Coverage of a recent study of the percentage of college students who abstain from drinking alcohol (Huang & others, 2009)
- New coverage of pregaming and gaming as becoming increasingly common rituals on college campuses, including recent research (DeJong, DeRicco, & Schneider, 2010; Ham & others, 2010; Read, Merrill, & Bytschkow, 2010)
- Updated material on trends in binge drinking by emerging adult women (Johnston & others, 2008)
- Updated information about trends in the percentage of U.S. adults who smoke (Centers for Disease Control and Prevention, 2010)
- Inclusion of a recent meta-analysis of studies on gender differences in sexuality (Petersen & Hyde, 2010)
- New discussion of the positive role of sexuality in well-being, including recent research (Brody & Costa, 2009)
- Expanded coverage of causes of homosexual behavior, including a recent large scale study in Sweden (King, 2011; Langstrom & others, 2010)
- Updated description of HIV and AIDS in the United States (National Center for Education Statistics, 2010)
- Updated discussion of HIV and AIDS around the world and especially in sub-Saharan African (Campbell, 2009; UNAIDS, 2009)
- New Connecting With Careers profile: Pat Hawkins, Community Psychologist and HIV/AIDS counselor
- Discussion of a recent research on a link between men's sexual narcissism and their sexual aggression (Widman & McNulty, 2009)
- New description of the red zone on college and university campuses and the time in their college years when women are most likely to have unwanted sexual experiences (Kimble & others, 2008)
- New discussion of Phyllis Moen's (2009a) view of the career mystique and how it has changed in recent years
- Application of William Damon's (2008) ideas in *The Path to Purpose* to career development
- New description of emerging adult Hari Prabhakar, student on a path to purpose
- Updated coverage of the percentage of full-time U.S. college students who are employed (National Center for Education Statistics, 2008)
- Inclusion of information about the recent banking financial meltdown and recession in the section on unemployment
- Expanded discussion of issues involved in dual-earner couples based on Phyllis Moen's (2009a, b) recent views
- Updated gender and ethnicity data on the U.S. labor force projected through 2016 (Occupational Outlook Handbook, 2008–2009)
- New Connecting Development to Life: Flow and Other Strategies for Living a More Creative Life

Chapter 14: Socioemotional Development in Early Adulthood

- New description of a longitudinal study linking an inhibited temperament in childhood with delays in developing a stable relationship and taking a first full-time job in adulthood (Asendorph, Denissen, & van Aken, 2008)
- New discussion of the Uppsala (Sweden) longitudinal study that found a link between shyness/inhibition in infancy/childhood and social anxiety at 21 years of age (Bohlin & Hagekull, 2010)
- Description of a recent study linking recent secure attachment to parents with ease in forming friendships in college (Parade, Leerkes, & Blankson, 2010)
- Coverage of a recent analysis that revealed a link between insecure attachment in adults and depression (Bakersman-Kranenburg & van IJzendoorn, 2009)
- New material showing a link between the serotonin transporter gene (5-HTTLPR) and unresolved adult attachment (Caspers & others, 2009)

- New discussion of Internet matchmaking, including a comparison with online matchmaking and in person initiation of relationships (Holmes, Little, & Welsh, 2009; Masters, 2008)
- Expanded description of adult friendships including the percentage of men and women who have a best friend and opportunities for making new friendships in adulthood (Blieszner, 2009).
- Updated coverage of the dramatic increase in the number of people who cohabit in the United States, including updated Figure 14.4 (Popenoe, 2009)
- Description of a recent study on the percentage of women who cohabited before the age of 24 (Schoen, Landale, & Daniels, 2007)
- Coverage of a recent study indicating that cohabiting women experience an elevated risk of partner violence (Brownridge, 2008)
- Discussion of recent research that found a link between cohabitation prior to becoming engaged and negative marital outcomes (Rhoades, Stanley, & Markham, 2009)
- Description of a recent meta-analysis of links between cohabitation and marital quality/stability (Jose, O'Leary, & Moyer, 2010)
- Updated statistics on the age of first marriage in the United States (U.S. Census Bureau, 2008)
- Updated information on the percentage of married persons 18 and older with 'Very Happy' marriages, including updated Figure 14.5 (Popenoe, 2009)
- Updated coverage of the age of first marriage in countries around the world (Waite, 2009)
- Discussion of a recent studying indicating that forgiving a spouse following significant betrayal was linked to an increased parenting alliance (Gordon & others, 2009)
- Description of the recent trend in the increase in number of divorces from 2005 to 2007 after a long downward trend since 1980 (Popenoe, 2009)
- Updated percentage of divorced U.S. men and women: 1950 to 2007, including updated Figure 14.7 (Popenoe, 2009)
- New description of characteristics of the partner that are likely to lead to a divorce (Hoelter, 2009)
- Coverage of a recent study that found divorced adults were more likely to smoke daily than married or cohabiting adults (Lindstrom, 2010)
- New material on the characteristics and timing of adults who get remarried (Sweeney, 2009, 2010)
- Updated and expanded discussion of the benefits and problems that characterize remarriage (Waite, 2009)

Chapter 15: Physical and Cognitive Development in Middle Adulthood

- Expanded commentary about time perspective in middle adulthood (Setterson, 2009)
- New material on the concept of *age identity* and the consistent finding that as adults get older their age identity is younger than their chronological age (Westerhof, 2009)
- Coverage of a recent meta-analysis linking metabolic syndrome with all-cause mortality (Hui, Liu, & Ho, 2010)
- Updated information about the cause of death in middle adulthood with cancer recently replacing cardiovascular disease as the leading cause of death in middle adulthood (National Center for Health Statistics, 2008)
- New description of later menopause being linked to increased risk of breast cancer (Mishra & others, 2009)
- New material on a large-scale longitudinal study on the sexual functioning of women as they made the transition through menopause (Avis & others, 2009)
- Description of a recent study on the benefits of aerobic exercise training in postmenopausal women (O'Donnell, Kirwan, & Goodman, 2009)
- Description of recent analyses confirming a link between combined estrogen/progestin hormone therapy and increased risk of cardiovascular disease (Tohs & others, 2010)
- Coverage of recent research studies in a number of countries indicating that coinciding with the decrease in HRT in recent years has been a related decline in breast cancer (Dobson, 2009; Parkin, 2009; Vankrunkelsven & others, 2009)
- Discussion of two recent research reviews that conclude HRT does not maintain or improve cognitive functioning in postmenopausal women (Hogervorst & others, 2009; Lethaby & others, 2008)
- Coverage of a recent study of testosterone decline with age in Taiwanese men and its link with obesity and diabetes (Liu & others, 2009)
- New material on the percentage of men with erectile dysfunction who report that it has impaired their self-esteem and harmed their relationship with their partner (Mirone & others, 2009)
- Description of a recent study indicating that Viagra improves the self-esteem, confidence, and relationships of men with erectile dysfunction (Glina & others, 2009)
- New material on a link between a low level of testosterone and the presence of metabolic syndrome and a high level of triglycerides (Corona & others, 2009)
- Expanded and updated discussion of lifestyle factors in erectile dysfunction (Heidelbaugh, 2010), including a recent experimental study showing that lifestyle changes in exercise and diet can reduce erectile dysfunction (Esposito & others, 2009)
- Description of a recent Canadian study of 40 to 64 year olds on how satisfying their sexual lives were compared to when they were in their 20s (Wright, 2006)

- New material on a recent large-scale study of the main sexual problems reported by 40 to 80 year old U.S. men and women (Laumann & others, 2009)
- New coverage of Timothy Salthouse's (2009) view that decline in many cognitive skills occurs in early adulthood and continue to decline in the 50s
- New information about decline in neurobiological functioning that might be linked to a decrease in age-related cognitive functioning (Del Tredici & Braak, 2008)
- Inclusion of Schaie's (2009) rebuttal to Salthouse's (2009) claim of decline in cognitive functioning in early and middle adulthood
- Description of the increasing evidence that religion has a positive link to health (McCullough & Willoughby, 2009)
- Coverage of a recent study indicating that certain aspect of religion are related to lower levels of worry, anxiety, and depressive symptoms (Rosmarin, Krumrei, & Andersson, 2009)
- Discussion of a recent study that compared different religious coping styles and adjustment (Ross & others, 2009)
- New material on the factors that shape an individual's exploration of meaning in life and whether developing a sense of meaning in life is linked to positive developmental outcomes (Krause, 2008, 2009)

Chapter 16: Socioemotional Development in Middle Adulthood

- New discussion of a longitudinal study on developmental changes in generativity from the college years through 43 years of age (Whitbourne, Sneed, & Sayer, 2009)
- New coverage of a recent study on changes in marital satisfaction in middle age and aspects of the empty nest syndrome (Gorchoff, John, & Helson, 2008)
- Coverage of a recent study that compared the relationships of married and partnered middle-aged adults with their late adulthood counterparts (Windsor & Butterworth, 2010)
- Description of a study on the quality of sibling relationships in childhood and their link with depression at age 50 (Waldinger, Vaillant, & Orav, 2007)
- New discussion of how trends in longevity and childbearing delay are influencing grandparenting availability (Szinovacz, 2009)
- Expanded and updated coverage of grandparents as full-time caregivers for grandchildren (Silverstein, 2009)
- Description of a recent study of grandparenting and adolescent adjustment in single-parent, stepparent, and two-parent biological families (Attar-Schwartz & others, 2009)
- Expanded discussion of the important role that middle age parents play in intergenerational relationships and inclusion of a recent study on relationships between aging parents and their children (Fingerman & others, 2008)
- Description of a recent study of how often middle-aged parents provide support to their children who are 18 years and older (Fingerman & others, 2009)
- Expanded and updated description of the closeness of women's relationships across generations (Merrill, 2009)
- Coverage of a recent intergenerational study of divorce and secure attachment (Crowell, Treboux, & Brockmeyer, 2009)
- Discussion of recent study on the intergenerational transmission of smoking (Chassin & others, 2008)

Chapter 17: Physical Development in Late Adulthood

- New coverage of cross-cultural comparisons of centenarians (Hall, 2008).
- New discussion of the evolutionary theory of aging in the section on biological theories of aging (Austad, 2009)
- Description of a recent study of telomere length in healthy and unhealthy centenarians (Terry & others, 2008b)
- Coverage of a recent study linking vitamin C and E use in women with telomere length (Xu & others, 2009)
- New material on the current consensus that under normal conditions it is unlikely that adults lose brain cells per se (Nelson, 2008)
- Coverage of recent information that new brain cells survive longer when rats are cognitively challenged to learn something (Shors, 2009)
- Description of recent research indicating links between aerobic fitness, greater volume in the hippocampus, and better memory (Erickson & others, 2009)
- Inclusion of a recent study on a link between exercise and frailty (Peterson & others, 2009)
- Coverage of recent research on obesity and mobility restrictions in older adults (Houston & others, 2009)
- Inclusion of recent research linking visual decline in older adults with a lower level of cognitive functioning (Clay & others, 2009)
- Discussion of recent research indicating that social less frequent social activity in older adults was linked to more rapid loss of motor function (Buchman & others, 2009)
- Description of the percentage of individuals 80-years-of-age and older who experience a significant reduction in smell (Lafreiere & Mann, 2009)
- Coverage of a recent study of touch sensitivity in older adults who are blind (Legge & others, 2008)
- Description of a recent study linking exercise with a lower risk of falling and fewer falling incidents in older adults (Yokoya, Demura, & Sato, 2009)
- Coverage of a recent high intensity strength training program for arthritis patients (Flint-Wagner & others, 2009)

- Inclusion of a recent study on a link between systolic blood pressure during exercise and increased long-term survival (Hedberg & others, 2009)
- Description of a recent study in which exercise capacity and walking were the best predictors of mortality in older adults with cardiac dysfunction (Reibis & others, 2010)
- New material on the role of exercise in improving immune system functioning in older adult women (Sakamoto & others, 2009)
- Discussion of a recent large scale study of 57 to 85 year olds on links between sexual activity and health, including gender differences (Lindau & Gavrilova, 2010)
- Inclusion of recent research on a link between the frailty of older adults and their SES status (Szanton & others, 2010)
- Updated and revision of discussion of resveratrol's effectiveness in red wine's benefit on health with recent evidence of its benefits (Das, Mukerjee, & Ray, 2010; Kaeberlein, 2010; Marques, Markus, & Morris, 2010; Queen & Tollefsbol, 2010)
- Discussion of a recent study of more than 11,000 women that found low cardiorespiratory fitness was a significant predictor of all-cause mortality (Farrell & others, 2010)
- Coverage of a recent analysis of the effectiveness of strength training with older adults (Peterson & others, 2010)
- Description of a recent study of taking supplemental vitamin C and risk of hip fracture in older women (Sahni & others, 2009)
- Coverage of a recent study of caloric restriction and verbal memory in older adults (Witte & others, 2009)
- Discussion of a recent study focused on whether underweight women and men live longer (Eandell, Carlsson, & Theobald, 2009)
- Description of recent large-scale studies of men indicating that taking vitamin C and vitamin E did not prevent cardiovascular disease or cancer (Gaziano & others, 2009; Sesso & others, 2008)
- Coverage of a recent studying finding no links between diet supplementation with antioxidant vitamins and cancer incidence/death (Lin & others, 2009)
- Inclusion of recent research indicating that red wine, but not white wine, killed several lines of cancer cells (Wallenborg & others, 2009)
- New Figure 17.21 on the decline in the percentage of older adults living in nursing homes in the U.S.

Chapter 18: Cognitive Development in Late Adulthood

- New chapter opening story, "Helen Small, a Cognitively fit 90-Year-Old."
- Expanded discussion of working memory and aging, including explanation of deficits in working memory in older adults because of their less efficient inhibition in preventing irrelevant information from entering working memory and their increased distractibility
- Expanded coverage of prospective memory, including information about older adults' better performance than younger adults in some real-life contexts, such as remembering to keep appointments (Luo & Craik, 2008)
- New Connecting Through Research interlude: Younger and Older Adults' Memory in the A.M., and P.M., including recent research (Hogan & others, 2009)
- Coverage of a recent study linking education to cognitive abilities in older adults; however, for older adults with less education, engaging in cognitive activities improved their episodic memory (Lachman & others, 2010)
- New section on decision-making in older adults (Healy & Hasher, 2009; Yoon & others, 2009)
- Coverage of a recent study that found older adults engaged in superior reasoning about social conflicts than young and middle-aged adults (Grossman & others, 2010)
- New discussion of Sternberg's recent application of his triarchic theory of intelligence to the concept of wisdom (Sternberg, 2009d, e; Sternberg, Jarvin, & Grigorenko, 2009; Sternberg, Jarvin, & Reznitskaya, 2009)
- New description of a recent study that found inconsistency in speed of processing was an early marker of impending death (Macdonald Hultsch, & Dixon, 2008)
- Inclusion of information from a recent extensive research review of enrichment effects on older adults' cognitive development (Hertzog & others, 2009)
- Discussion of a recent study on differences in connectivity between brain regions in younger and older adults (Leshikar & others, 2010)
- New coverage of Denise Park and Patricia Reuter-Lorenz' (2009) scaffolding view of the aging, adaptive brain and cognition
- Description of recent research indicating that when older adults engage in cognitively stimulating activities, the onset of rapid memory decline is delayed (Hall & others, 2009)
- Inclusion of recent research on speed of processing training with older drivers with speed of processing difficulties (Edwards, Delahunt, & Mahncke, 2009)
- Discussion of age-related cognitive decline in adults with mood disorders, such as depression (Gualtieri & Johnson, 2008)
- Expansion and updating of a number of aspects of depression in older adults based on a recent review (Fiske, Wetherell, & Gatz, 2009)
- Description of a recent study in which depressive symptoms predicted cognitive decline in older adults (Kohler & others, 2010)

- Updated coverage of the estimated risk for developing dementia in women and men for older adults 85 years and older (Alzheimer's Association, 2010)
- Updated description of the percentage of individuals estimated to develop Alzheimer disease in the next 10 years at age 65, 75, and 85 for women and men, including new Figure 18.6 (Alzheimer's Association, 2010)
- New coverage of why it is important to focus on biological and environmental risk factors, preventive strategies, and maintenance of cognitive reserves in middle adulthood in research on Alzheimer disease
- New discussion of the role that oxidative stress might play in Alzheimer disease (Bonda & others, 2010; Di Bona & others, 2010)
- New coverage of a research review indicating that fMRI measurement of neuron loss in the medial temporal lobe predicts memory loss and eventually dementia (Vellas & Aisen, 2010)
- Expanded discussion of drug treatment of Alzheimer disease including recent indications of how effective the drugs are
- Inclusion of estimates of the percentage of individuals 65 years of age and older who have mild cognitive impairment (MCI) (Alzheimer's Association)
- Expanded coverage of MCI, including the use of fMRI scans with individuals who have MCI to predict which of these individuals are likely to develop Alzheimer disease
- Description of recent research on cortical thickness and MCI (Wang & others, 2009)
- Inclusion of information that the Federal Drug Administration has yet to approve any drugs for the treatment of MCI

Chapter 19: Socioemotional Development in Late Adulthood

- Discussion of a recent study that found a life-review course, "Looking for Meaning," reduced middle-aged and older adults' depressive symptoms (Pot & others, 2010)
- Description of three recent studies of life regrets in older adults: (Bauer, Wrosch, & Jobin, 2008; Choi & Jun, 2009; Torges, Stewart, & Nolen-Hoeksema, 2008)
- Inclusion of recent research on institutionalized older adults that revealed reminiscence therapy increased their life satisfaction and reduced their depression (Chiang & others, 2010)
- Coverage of a recent study of the components of conscientiousness that increased in the transition to late adulthood (Jackson & others, 2009)
- Expanded discussion of self-esteem and possible selves in older adults (Smith, 2009)
- Added commentary about the added burden and stress placed on many older adults because of the recent economic crisis and the precipitous decline in their non-government retirement funds
- Updated data on the percentage of older adults living in poverty (U.S. Census Bureau, 2009)
- New description of the link between poverty and increased health outcomes in older adults (Wight & others, 2008)
- Coverage of recent study indicating that low SES increases the risk of death in older adults (Krueger & Chang, 2008)
- Updated statistics on the percent of older adult women and men who are divorced or separated (U.S. Census Bureau, 2009)
- Expanded discussion of divorce in late adulthood, including cohort effects and gender differences (Peek, 2009)
- Updated statistics on the percentage of older adults who are married and the percentage who are widowed (U.S. Census Bureau, 2010)
- Coverage of a recent study on the percentage of men and women 75 to 85 years of age who have a stable sexual partner (Waite & others, 2009)
- Expanded material on friendship in older adults, including comparison of the friendships of young adults and older adults (Zettel-Watson & Rook, 2009)
- Expanded description of loneliness and comparison of loneliness in younger and older adults (Schnittker, 2007; Koropeckyj-Cox, 2009)
- Description of a recent study of quality of marriages in older adults and its link to emotional and social loneliness (de Jong Gierveld & others, 2009)
- Coverage of a recent study in which loneliness predicted increased blood pressure four years later in middle-aged and older adults (Hawkley & others, 2010)
- Inclusion of information about a 12-year longitudinal studying linking persistently low or declining feelings of usefulness to others and a higher risk of dying at a younger age (Gruenewald & others, 2009)
- Description of a recent study in which volunteering was linked to less frailty in older adults (Jung & others, 2010)
- Expanded and updated discussion of volunteering, including recent information about developmental changes in volunteering (Burr, 2009)
- Coverage of an 8-year longitudinal study of factors involved in continuing to volunteer as older adults and factors that are linked to nonvolunteers becoming volunteers (Butrica, Johnson, & Zedlewski, 2009)
- Discussion of a recent study of the benefits of volunteering as an older adult (Morrow-Howell, Hong, & Tang, 2009)

Chapter 20: Death, Dying, and Grieving

- New information at the beginning of chapter that discusses how most of what we know about death, dying, and grieving is based on older adults because older adults account for approximately two-thirds of the 2 millions deaths each year in the U.S.

- Discussion of a recent study of contradictions in individuals' end-of-life decisions about themselves and relatives (Sviri & others, 2009)
- Coverage of a recent study of the percentage of patients who had a living will and had discussed health care wishes with their family (Clements, 2009)
- Added commentary in the coverage of what constitutes a good death (Carr, 2009)
- Description of a recent study on the lack of information doctors tend to provide to dying individuals about how long they are likely to live (Harrington & Smith, 2008)
- Update on the countries and states in the U.S. allowing euthanasia (Smets & others, 2010; Watson, 2009)
- New material that research studies have found that rather than perceiving themselves to be invulnerable many adolescents perceive that they will experience an early death (Fischhoff & others, 2010; Reyna & Rivers, 2008)
- Coverage of a recent study indicating that as individuals move closer to death, they become more spiritual (Park, 2008)
- Discussion of a recent study of meaning in life for individuals with a chronic, life-threatening illness (Park & others, 2008)
- Added commentary about how difficult the coping process is for parents following the death of a child (De Lisle-Porter & Podruchny, 2009)
- Description of a recent study revealed that experiencing humor, laughter, and happiness in the course of bereaving for a spouse who had recently died was strongly associated with better bereavement adjustment (Lund & others, 2009)
- Coverage of recent search that found more prolonged grief in African Americans than non-Latino Whites (Goldsmith & others, 2008)
- Inclusion of a recent study of a decrease in the life satisfaction over time in 80+ year old individuals whose spouse died (Berg & others, 2009)
- Description of a recent study on meaning in life and anger in bereaved spouses (Kim, 2009)
- New information about the percentage of women and men 65 years of age and older who are widowed in the U.S. (Administration on Aging, 2009)
- Coverage of a recent study of older adults that revealed widowhood was linked to a higher risk of depression in men than women (Mechakra-Tahiri & others, 2010)
- Updated information about the significant increase in the percentage of Americans who are cremated (Cremation Association of North America, 2008)
- Discussion of trends in death, mourning, and funerals (Callahan, 2009)

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Lifespan development has become an enormous, complex field and no single author can possibly be an expert in all areas of the field. To solve this problem, beginning with the sixth edition, I have sought the input of leading experts in many different areas of lifespan development. This tradition continues in the thirteenth edition. The experts have provided me with detailed recommendations of new research to include in every period of the lifespan. The panel of experts is literally a who's who in the field of lifespan development. A listing of the expert consultants, their photographs, and biographies is on p. xiv.

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Instructor's Manual *by Rebecca Fraser-Thill, Bates College*. Each chapter of the *Instructor's Manual* is introduced by a Resources Overview. This fully integrated tool helps instructors more easily locate and choose among the many resources available for the course by linking each element of the Instructor's Manual to a particular teaching topic within the chapter. These elements include lecture suggestions, classroom activities, personal applications, research project ideas, video suggestions, and handouts.

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Student Resources

Adaptive Diagnostic Tool This diagnostic tool is an unparalleled, intelligent learning system based on cognitive mapping that *diagnoses* your students' knowledge of a particular subject and then creates an individualized learning path geared toward student success in your course. It offers individualized assessment by delivering appropriate learning material in the form of questions at the right time, helping students attain mastery of the content. Whether the system is assigned by you or used independently by students as a study tool, the results can be recorded in an easy-to-use grade report that allows you to measure student progress at all times an coach your students to success.

As an added benefit, all content covered in this adaptive diagnostic is tied to learning objectives for your course so that you can use the results as evidence of subject mastery. This tool also provides a personal study plan that allows the student to estimate the time it will take and number of questions required to learn the subject matter. Your students will learn faster, study more efficiently, and retain more knowledge when using *Life-Span Development*.

The Milestones Program Our new assessable video-based program tracks human development through each major life stage. Starting from infancy, students will watch each baby grow, and achieve the major developmental milestones such as balance, development of fine motor control, and social interactions. The program continues through adulthood capturing attitudes towards issues such as family, sexuality and death and dying.

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LIFE-SPAN
Development

section one

All the world's a stage. And all the men and women merely players. They have their exits and their entrances, and one man in his time plays many parts.

—WILLIAM SHAKESPEARE
English Playwright, 17th Century

The Life-Span Perspective

This book is about human development—its universal features, its individual variations, its nature. Every life is distinct, a new biography in the world. Examining the shape of life-span development allows us to understand it better. *Life-Span Development* is about the rhythm and meaning of people's lives, about turning mystery into understanding, and about weaving a portrait of who each of us was, is, and will be. In Section 1, you will read "Introduction" (Chapter 1).

chapter 1

INTRODUCTION

chapter outline

1 The Life-Span Perspective

Learning Goal 1 Discuss the distinctive features of a life-span perspective on development.

The Importance of Studying Life-Span Development
Characteristics of the Life-Span Perspective
Some Contemporary Concerns

2 The Nature of Development

Learning Goal 2 Identify the most important processes, periods, and issues in development.

Biological, Cognitive, and Socioemotional Processes
Periods of Development
The Significance of Age
Developmental Issues

3 Theories of Development

Learning Goal 3 Describe the main theories of human development.

Psychoanalytic Theories
Cognitive Theories
Behavioral and Social Cognitive Theories
Ethological Theory
Ecological Theory
An Eclectic Theoretical Orientation

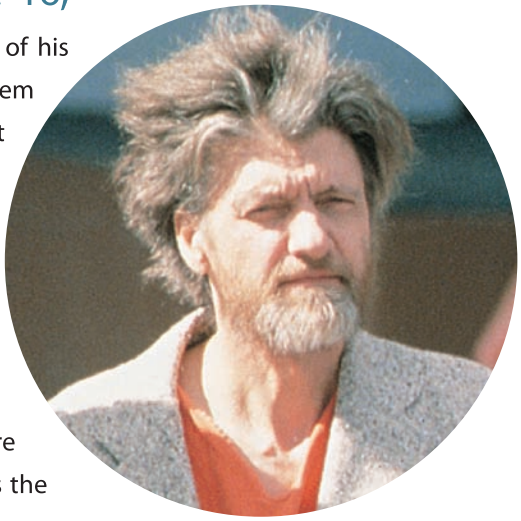
4 Research in Life-Span Development

Learning Goal 4 Explain how research on life-span development is conducted.

Methods for Collecting Data
Research Designs
Time Span of Research
Conducting Ethical Research
Minimizing Bias

Ted Kaczynski sprinted through high school, not bothering with his junior year and making only passing efforts at social contact. Off to Harvard at age 16, Kaczynski was a loner during his college years. One of his roommates at Harvard said that he avoided people by quickly shuffling by them and slamming the door behind him. After obtaining his Ph.D. in mathematics at the University of Michigan, Kaczynski became a professor at the University of California at Berkeley. His colleagues there remember him as hiding from social circumstances—no friends, no allies, no networking.

After several years at Berkeley, Kaczynski resigned and moved to a rural area of Montana where he lived as a hermit in a crude shack for 25 years. Town residents described him as a bearded eccentric. Kaczynski traced his own difficulties to growing up as a genius in a kid's body and sticking out like a sore thumb in his surroundings as a child. In 1996, he was arrested and charged as the notorious Unabomber, America's most wanted killer. Over the course of 17 years, Kaczynski had sent 16 mail bombs that left 23 people wounded or maimed, and 3 people dead. In 1998, he pleaded guilty to the offenses and was sentenced to life in prison.



Ted Kaczynski, the convicted Unabomber, traced his difficulties to growing up as a genius in a kid's body and not fitting in when he was a child.

A decade before Kaczynski mailed his first bomb, Alice Walker spent her days battling racism in Mississippi. She had recently won her first writing fellowship, but rather than use the money to follow her dream of moving to Senegal, Africa, she put herself into the heart and heat of the civil rights movement. Walker had grown up knowing the brutal effects of poverty and racism. Born in 1944, she was the eighth child of Georgia sharecroppers who earned $300 a year. When Walker was 8, her brother accidentally shot her in the left eye with a BB gun. By the time her parents got her to the hospital a week later (they had no car), she was blind in that eye, and it had developed a disfiguring layer of scar tissue. Despite the counts against her, Walker overcame pain and anger and went on to win a Pulitzer Prize for her book *The Color Purple*. She became not only a novelist, but also an essayist, a poet, a short-story writer, and a social activist.

Alice Walker won the Pulitzer Prize for her book *The Color Purple*. Like the characters in her book, Walker overcame pain and anger to triumph and celebrate the human spirit.

preview

What leads one individual, so full of promise, to commit brutal acts of violence and another to turn poverty and trauma into a rich literary harvest? If you have ever wondered why people turn out the way they do, you have asked yourself the central question we will explore in this book. This book is a window into the journey of human development—your own and that of every other member of the human species. In this first chapter, we will explore what it means to take a life-span perspective on development, examine the nature of development, and outline how science helps us to understand it.

1 The Life-Span Perspective

LG1 Discuss the distinctive features of a life-span perspective on development.

- The Importance of Studying Life-Span Development
- Characteristics of the Life-Span Perspective
- Some Contemporary Concerns

Each of us develops partly like all other individuals, partly like some other individuals, and partly like no other individuals. Most of the time our attention is directed to an individual's uniqueness. But as humans, we have all traveled some common paths. Each of us—Leonardo da Vinci, Joan of Arc, George Washington, Martin Luther King, Jr., and you—walked at about 1 year, engaged in fantasy play as a young child, and became more independent as a youth. Each of us, if we live long enough, will experience hearing problems and the death of family members and friends. This is the general course of our **development,** the pattern of movement or change that begins at conception and continues through the human life span.

In this section, we will explore what is meant by the concept of development and why the study of life-span development is important. We will outline the main characteristics of the life-span perspective and discuss various sources of contextual influences. In addition, we will examine some contemporary concerns in life-span development.

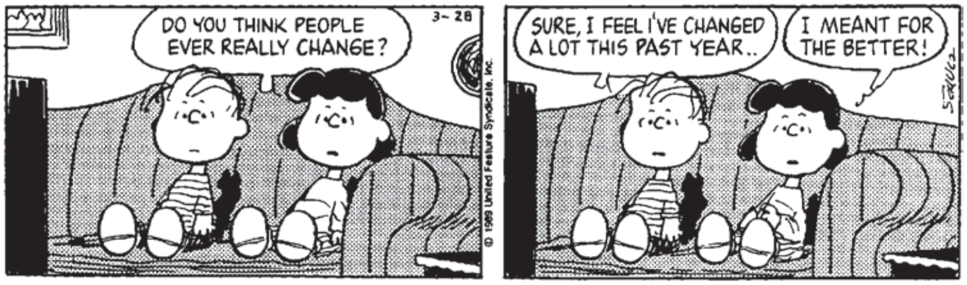
> We reach backward to our parents and forward to our children, and through their children to a future we will never see, but about which we need to care.
>
> —Carl Jung
>
> *Swiss Psychiatrist, 20th Century*

THE IMPORTANCE OF STUDYING LIFE-SPAN DEVELOPMENT

How might people benefit from examining life-span development? Perhaps you are, or will be, a parent or teacher. If so, responsibility for children is, or will be, a part of your everyday life. The more you learn about them, the better you can deal with them. Perhaps you hope to gain some insight about your own history—as an infant, a child, an adolescent, or a young adult. Perhaps you want to know more about what your life will be like as you grow through the

development The pattern of change that begins at conception and continues through the life span. Most development involves growth, although it also includes decline brought on by aging and dying.

life-span perspective The perspective that development is lifelong, multidimensional, multidirectional, plastic, multidisciplinary, and contextual; involves growth, maintenance, and regulation; and is constructed through biological, sociocultural, and individual factors working together.


DO YOU THINK PEOPLE EVER REALLY CHANGE?
3-28
© 1969 United Feature Syndicate, Inc.
SURE, I FEEL I'VE CHANGED A LOT THIS PAST YEAR..
I MEANT FOR THE BETTER!
SCHULZ

PEANUTS © United Features Syndicate, Inc.

adult years—as a middle-aged adult, or as an adult in old age, for example. Or perhaps you just stumbled onto this course, thinking that it sounded intriguing and that the study of the human life span might raise some provocative issues. Whatever your reasons, you will discover that the study of life-span development is intriguing and filled with information about who we are, how we came to be this way, and where our future will take us.

Most development involves growth, but it also includes decline (as in dying). In exploring development, we will examine the life span from the point of conception until the time when life (at least, life as we know it) ends. You will see yourself as an infant, as a child, and as an adolescent, and be stimulated to think about how those years influenced the kind of individual you are today. And you will see yourself as a young adult, as a middle-aged adult, and as an adult in old age, and be motivated to think about how your experiences today will influence your development through the remainder of your adult years.

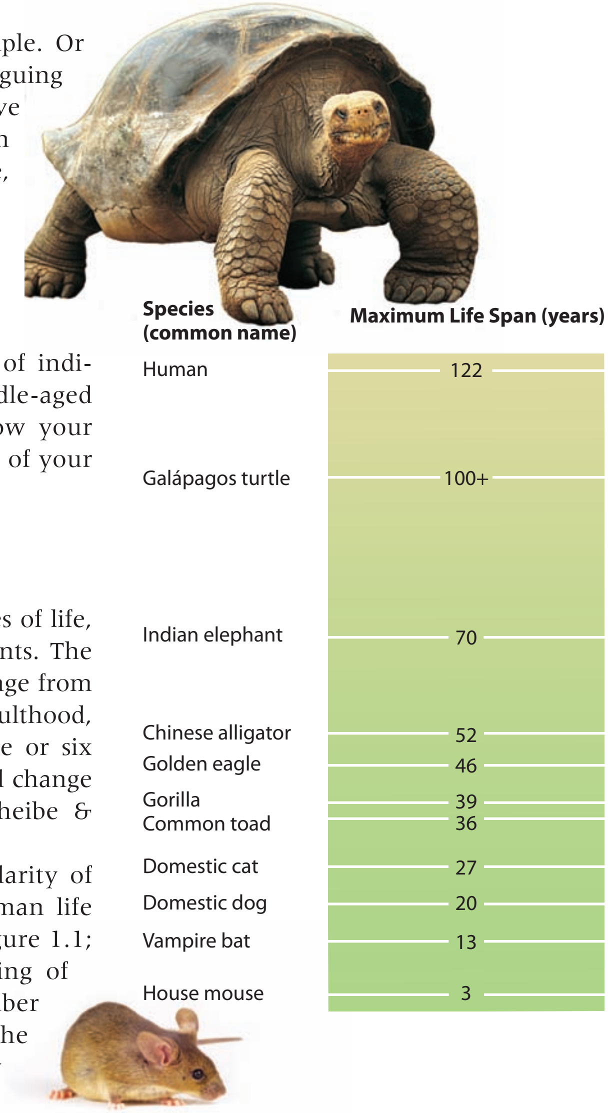


FIGURE **1.1**

MAXIMUM RECORDED LIFE SPAN FOR DIFFERENT SPECIES. Our only competitor for the maximum recorded life span is the Galápagos turtle.

CHARACTERISTICS OF THE LIFE-SPAN PERSPECTIVE

Although growth and development are dramatic during the first two decades of life, development is not something that happens only to children and adolescents. The traditional approach to the study of development emphasizes extensive change from birth to adolescence (especially during infancy), little or no change in adulthood, and decline in old age. But a great deal of change does occur in the five or six decades after adolescence. The life-span approach emphasizes developmental change throughout adulthood as well as childhood (Park & Huang, 2010; Scheibe & Carstensen, 2010).

Recent increases in human life expectancy contributed to the popularity of the life-span approach to development. The upper boundary of the human life span (based on the oldest age documented) is 122 years, as indicated in Figure 1.1; this maximum life span of humans has not changed since the beginning of recorded history. What has changed is life expectancy: the average number of years that a person born in a particular year can expect to live. In the 20th century alone, life expectancy in the United States increased by 30 years, thanks to improvements in sanitation, nutrition, and medicine (see Figure 1.2). As we move toward the end of the first decade of the 21st century, the life expectancy in the United States is 78 years of age (U.S. Census Bureau, 2008). Today, for most individuals in developed countries, childhood and adolescence represent only about one-fourth of their lives.

The belief that development occurs throughout life is central to the life-span perspective on human development, but this perspective has other characteristics as well. According to life-span development expert Paul Baltes (1939–2006), the **life-span perspective** views development as lifelong, multidimensional, multidirectional, plastic, multidisciplinary, and contextual, and as a process that involves growth, maintenance, and regulation of loss (Baltes, 1987, 2003; Baltes, Lindenberger, & Staudinger, 2006). In Baltes' view, it is important to understand that development is constructed through biological, sociocultural, and individual factors working together. Let's look at each of these characteristics.

Paul Baltes, a leading architect of the life-span perspective of development, conversing with one of the long-time research participants in the Berlin Aging Study that he directs. She joined the study in the early 1990s and has participated six times in extensive physical, medical, psychological, and social assessments. In her professional life, she was a practicing medical doctor.

Development Is Lifelong In the life-span perspective, early adulthood is not the endpoint of development; rather, no age period dominates development. Researchers increasingly study the experiences and psychological orientations of adults at different points in their lives. Later in this chapter, we will describe the age periods of development and their characteristics.

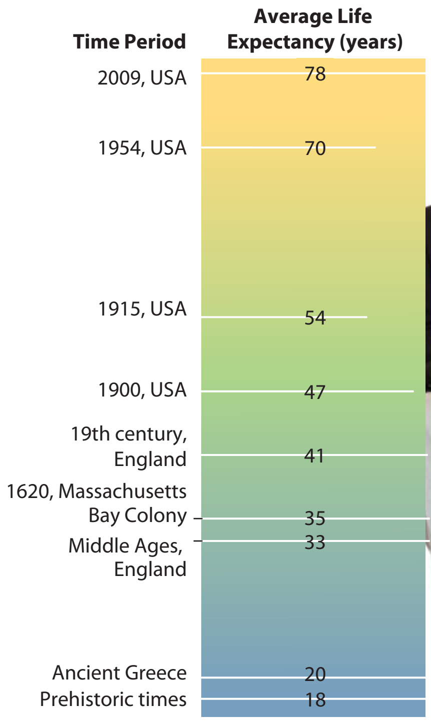


FIGURE **1.2**

HUMAN LIFE EXPECTANCY AT BIRTH FROM PREHISTORIC TO CONTEMPORARY TIMES. It took 5,000 years to extend human life expectancy from 18 to 41 years of age.

Development Is Multidimensional Whatever your age, your body, your mind, your emotions, and your relationships are changing and affecting each other. Consider the development of Ted Kaczynski, the Unabomber discussed at the opening of the chapter. When he was 6 months old, he was hospitalized with a severe allergic reaction and his parents were rarely allowed to visit the baby. According to his mother, the previously happy baby was never the same. The infant became withdrawn and unresponsive. As Ted grew up, he had periodic "shutdowns" accompanied by rage. In his mother's view, a biological event in infancy warped the development of her son's mind and emotions.

Development consists of biological, cognitive, and socioemotional dimensions. Even within a dimension, there are many components—for example, attention, memory, abstract thinking, speed of processing information, and social intelligence are just a few of the components of the cognitive dimension.

Development Is Multidirectional Throughout life, some dimensions or components of a dimension expand and others shrink. For example, when one language (such as English) is acquired early in development, the capacity for acquiring second and third languages (such as Spanish and Chinese) decreases later in development, especially after early childhood (Levelt, 1989). During adolescence, as individuals establish romantic relationships, their time spent with friends may decrease. During late adulthood, older adults might become wiser by being able to call on experience to guide their intellectual decision making, but they perform more poorly on tasks that require speed in processing information (Hoyer & Roodin, 2009; Staudinger & Gluck, 2011).

Development Is Plastic Even at 10 years old, Ted Kaczynski was extraordinarily shy. Was he destined to remain forever uncomfortable with people? Developmentalists debate how much plasticity people have in various dimensions at different points in their development. Plasticity means the capacity for change. For example, can you still improve your intellectual skills when you are in your seventies or eighties? Or might these intellectual skills be fixed by the time you are in your thirties so that further improvement is impossible? Researchers have found that the cognitive skills of older adults can be improved through training and developing better strategies (Boron, Willis, & Schaie, 2007; Hillman, Erickson, & Kramer, 2008). However, possibly we possess less capacity for change when we become old (Baltes, Reuter-Lorenz, & Rösler, 2006). The search for plasticity and its constraints is a key element on the contemporary agenda for developmental research (Park & Huang, 2010; Siegler & others, 2009).

Developmental Science Is Multidisciplinary Psychologists, sociologists, anthropologists, neuroscientists, and medical researchers all share an interest in unlocking the mysteries of development through the life span. How do your heredity and health limit your intelligence? Do intelligence and social relationships change with age in the same way around the world? How do families and schools influence intellectual development? These are examples of research questions that cut across disciplines.

Development Is Contextual All development occurs within a context, or setting. Contexts include families, schools, peer groups, churches, cities, neighborhoods, university laboratories, countries, and so on. Each of these settings is influenced by historical, economic, social, and cultural factors (Goodnow, 2010; Suarez-Orosco & Suarez-Orosco, 2010).

Contexts, like individuals, change. Thus, individuals are changing beings in a changing world. As a result of these changes, contexts exert three types of influences (Baltes, 2003): (1) normative age-graded influences, (2) normative history-graded influences, and (3) nonnormative or highly individualized life events. Each

developmental **connection**

Exercise. What effect might exercise have on older adult's ability to process information? Chapter 17, p. 552

What characterizes the life-span perspective of development?

of these types can have a biological or environmental impact on development. **Normative age-graded influences** are similar for individuals in a particular age group. These influences include biological processes such as puberty and menopause. They also include sociocultural, environmental processes such as beginning formal education (usually at about age 6 in most cultures) and retirement (which takes place in the fifties and sixties in most cultures).

Normative history-graded influences are common to people of a particular generation because of historical circumstances. For example, in their youth American baby boomers shared the experience of the Cuban missile crisis, the assassination of John F. Kennedy, and the Beatles invasion. Other examples of normative history-graded influences include economic, political, and social upheavals such as the Great Depression in the 1930s, World War II in the 1940s, the civil rights and women's rights movements of the 1960s and 1970s, the terrorist attacks of 9/11/2001, as well as the integration of computers and cell phones into everyday life during the 1990s (Schaie, 2009, 2010a, b). Long-term changes in the genetic and cultural makeup of a population (due to immigration or changes in fertility rates) are also part of normative historical change.

Nonnormative life events, such as Hurricane Katrina in August 2005, are unusual circumstances that have a major impact on a person's life.

Nonnormative life events are unusual occurrences that have a major impact on the individual's life. These events do not happen to all people, and when they do occur they can influence people in different ways. Examples include the death of a parent when a child is young, pregnancy in early adolescence, a fire that destroys a home, winning the lottery, or getting an unexpected career opportunity.

developmental **connection**

Middle Age. Adults typically face more losses in middle age than earlier in life. Chapter 15, p. 477

Development Involves Growth, Maintenance, and Regulation of Loss

Baltes and his colleagues (2006) assert that the mastery of life often involves conflicts and competition among three goals of human development: growth, maintenance, and regulation of loss. As individuals age into middle and late adulthood, the maintenance and regulation of loss in their capacities takes center stage away from growth. Thus, a 75-year-old man might aim not to improve his memory or his golf swing but to maintain his independence and his ability to play golf at all. In Chapters 15 and 16, we will discuss these ideas about maintenance and regulation of loss in greater depth.

How might growth versus maintenance and regulation be reflected in the development of this grandfather and his grandchild?

Development Is a Co-Construction of Biology, Culture, and the Individual

Development is a co-construction of biological, cultural, and individual factors working together (Baltes, Reuter-Lorenz, & Rösler, 2006). For example, the brain shapes culture, but it is also shaped by culture and the experiences that individuals have or pursue. In terms of individual factors, we can go beyond what our genetic inheritance and environment give us. We can author a unique developmental path by actively choosing from the environment the things that optimize our lives (Rathunde & Csikszentmihalyi, 2006).

SOME CONTEMPORARY CONCERNS

Pick up a newspaper or magazine and you might see headlines like these: "Political Leanings May Be Written in the Genes," "Mother Accused of Tossing Children into Bay," "Gender Gap Widens," "FDA Warns About ADHD Drug," "Heart Attack Deaths Higher in Black Patients," "Test May Predict Alzheimer's Disease." Researchers using the life-span perspective are examining these and many other topics of contemporary concern. The roles that health and well-being, parenting, education, and sociocultural contexts play in life-span development, as well as how social policy is related to these issues, are a particular focus of this textbook.

Health and Well-Being Health professionals today recognize the power of lifestyles and psychological states in health and well-being (Hahn, Payne, & Lucas,

normative age-graded influences These are influences that are similar for individuals in a particular age group.

normative history-graded influences Influences that are common to people of a particular generation because of historical circumstances.

nonnormative life events Unusual occurrences that have a major impact on an individual's life.

connecting with careers

Luis Vargas, Child Clinical Psychologist

Luis Vargas is Director of the Clinical Child Psychology Internship Program and a professor in the Department of Psychiatry at the University of New Mexico Health Sciences Center. He also is Director of Psychology at the University of New Mexico children's Psychiatric Center.

Vargas obtained an undergraduate degree in psychology from St. Edwards University in Texas, a master's degree in psychology from Trinity University in Texas, and a Ph.D. in clinical psychology from the University of Nebraska-Lincoln.

Vargas' main interests are cultural issues and the assessment and treatment of children, adolescents, and families. He is motivated to find better ways to provide culturally responsive mental health services. One of his special interests is the treatment of Latino youth for delinquency and substance abuse.

Luis Vargas (*left*) conducting a child therapy session.

For more information about what clinical psychologists do, see page 46 in the Careers in Life-Span Development appendix.

2011; Sparling & Redican, 2011). In every chapter of this book, issues of health and well-being are integrated into our discussion.

Clinical psychologists are among the health professionals who help people improve their well-being. Read about one clinical psychologist who helps adolescents who have become juvenile delinquents or substance abusers in *Connecting With Careers*.

Parenting and Education Can two gay men raise a healthy family? Are children harmed if both parents work outside the home? Are U.S. schools failing to teach children how to read and write and calculate adequately? We hear many questions like these related to pressures on the contemporary family and the problems of U.S. schools (Johnson & others, 2011; McCombs, 2010). In later chapters, we will analyze child care, the effects of divorce, parenting styles, child maltreatment, intergenerational relationships, early childhood education, relationships between childhood poverty and education, bilingual education, new educational efforts to improve lifelong learning, and many other issues related to parenting and education (Bredekamp, 2011).

Sociocultural Contexts and Diversity Health, parenting, and education—like development itself—are all shaped by their sociocultural context. To analyze this context, four concepts are especially useful: culture, ethnicity, socioeconomic status, and gender.

Culture encompasses the behavior patterns, beliefs, and all other products of a particular group of people that are passed on from generation to generation. Culture results from the interaction of people over many years. A cultural group can be as large as the United States or as small as an isolated Appalachian town. Whatever its size, the group's culture influences the behavior of its members (Cole

culture The behavior patterns, beliefs, and all other products of a group that are passed on from generation to generation.

cross-cultural studies Comparison of one culture with one or more other cultures. These provide information about the degree to which development is similar, or universal, across cultures, and the degree to which it is culture-specific.

ethnicity A characteristic based on cultural heritage, nationality characteristics, race, religion, and language.

socioeconomic status (SES) Refers to the grouping of people with similar occupational, educational, and economic characteristics.

gender The characteristics of people as males or females.

Two Korean-born children on the day they became United States citizens. Asian American and Latino children are the fastest-growing immigrant groups in the United States. *How diverse are the students in your life-span development class? How are their experiences in growing up likely similar to or different from yours?*

Around the world women too often are treated as burdens rather than assets in the political process. *What can be done to strengthen women's roles in the political process?*

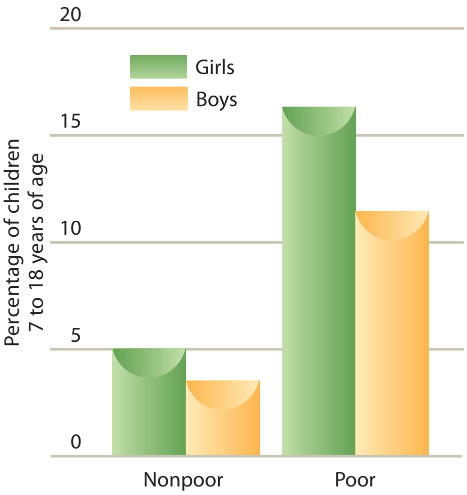


FIGURE **1.3**

PERCENTAGE OF CHILDREN 7 TO 18 YEARS OF AGE AROUND THE WORLD WHO HAVE NEVER BEEN TO SCHOOL OF ANY KIND. When UNICEF (2004) surveyed the education that children around the world are receiving, it found that far more girls than boys receive no formal schooling at all.

& Cagigas, 2010). **Cross-cultural studies** compare aspects of two or more cultures. The comparison provides information about the degree to which development is similar, or universal, across cultures, or is instead culture-specific (Goodnow, 2010; Kitayama, 2011).

Ethnicity (the word *ethnic* comes from the Greek word for "nation") is rooted in cultural heritage, nationality, race, religion, and language. African Americans, Latinos, Asian Americans, Native Americans, European Americans, and Arab Americans are a few examples of broad ethnic groups in the United States. Diversity exists within each ethnic group (Banks, 2010; Nieto, 2010).

Socioeconomic status (SES) refers to a person's position within society based on occupational, educational, and economic characteristics. Socioeconomic status implies certain inequalities. Differences in the ability to control resources and to participate in society's rewards produce unequal opportunities (Huston & Bentley, 2010).

Gender refers to the characteristics of people as males and females. Few aspects of our development are more central to our identity and social relationships than gender (Best, 2010; Martin & Ruble, 2010).

In the United States, the sociocultural context has become increasingly diverse in recent years. Its population includes a greater variety of cultures and ethnic groups than ever before. This changing demographic tapestry promises not only the richness that diversity produces but also difficult challenges in extending the American dream to all individuals (Bornstein & Cote, 2010; McLoyd & others, 2009). We will discuss sociocultural contexts and diversity in each chapter.

A special cross-cultural concern is the educational and psychological conditions of women around the world (UNICEF, 2010). Inadequate educational opportunities, violence, and mental health issues are just some of the problems faced by many women.

One analysis found that a higher percentage of girls than boys around the world have never had any education (UNICEF, 2004) (see Figure 1.3). The countries with the fewest females being educated are in Africa, where in some areas, girls and women are receiving no education at all. Canada, the United States, and Russia have

Doly Akter, age 17, lives in a slum in Dhaka, Bangladesh, where sewers overflow, garbage rots in the streets, and children are undernourished, Nearly two-thirds of young women in Bangladesh get married before they are 18. Doly recently organized a club supported by UNICEF in which girls go door-to-door to monitor the hygiene habits of households in their neighborhood. The monitoring has led to improved hygiene and health in the families. Also, her group has managed to stop several child marriages by meeting with parents and convincing them that it is not in their daughter's best interests. When talking with parents in their neighborhoods, the girls in the club emphasize the importance of staying in school and how this will improve their daughters' future. Doly says that the girls in her UNICEF group are far more aware of their rights than their mothers ever were. (UNICEF, 2007).

the highest percentages of educated women. In developing countries, 67 percent of women over the age of 25 (compared with 50 percent of men) have never been to school. At the beginning of the 21st century, 80 million more boys than girls were in primary and secondary educational settings around the world (United Nations, 2002).

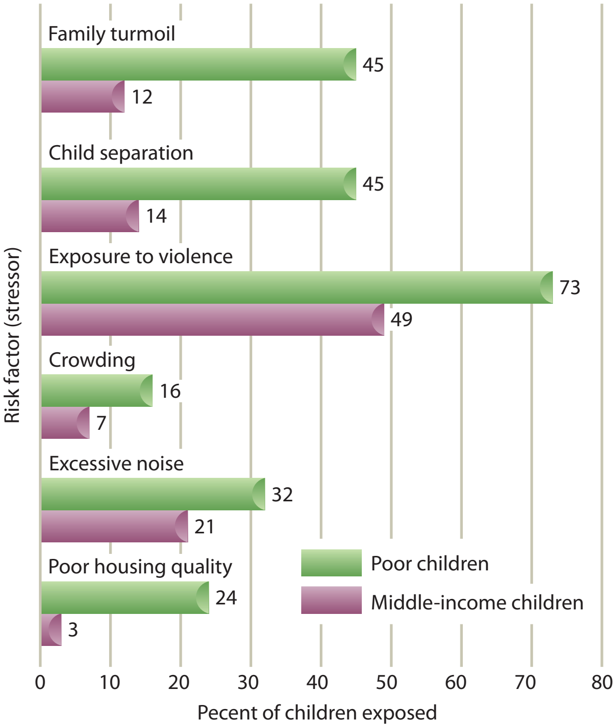


FIGURE **1.4**

EXPOSURE TO SIX STRESSORS AMONG POOR AND MIDDLE-INCOME CHILDREN. One recent study analyzed the exposure to six stressors among poor children and middle-income children (Evans & English, 2002). Poor children were much more likely to face each of these stressors.

Social Policy **Social policy** is a government's course of action designed to promote the welfare of its citizens. Values, economics, and politics all shape a nation's social policy. Out of concern that policy makers are doing too little to protect the well-being of children and older adults, life-span researchers are increasingly undertaking studies that they hope will lead to effective social policy (Balsano, Theokas, & Bobek, 2009).

Statistics such as infant mortality rates, mortality among children under 5, and the percentage of children who are malnourished or living in poverty provide benchmarks for evaluating how well children are doing in a particular society (UNICEF, 2010). Marian Wright Edelman, a tireless advocate of children's rights, has pointed out that indicators like these place the United States at or near the lowest rank for industrialized nations in the treatment of children.

Children who grow up in poverty represent a special concern (McLoyd & others, 2009; Tamis-LeMonda & McFadden, 2010). In 2006, approximately 17.4 percent of U.S. children were living in families below the poverty line (Federal Interagency Forum on Child and Family Statistics, 2008). This is an increase from 2001 (16.2 percent) but down from a peak of 22.7 percent in 1993. As indicated in Figure 1.4, one study found that a higher percentage of U.S. children in poor families than in middle-income families were exposed to family turmoil, separation from a parent, violence, crowding, excessive noise, and poor housing (Evans & English, 2002). A recent study also revealed that the more

Cradle to prison
VERY Child DESERVE To HAVE Good HEALTH!!!
Children need free HEALTHCARE NOW!!!
COVER ALL Children

Marian Wright Edelman, president of the Children's Defense Fund (shown here advocating for health care), has been a tireless advocate of children's rights and has been instrumental in calling attention to the needs of children. *What are some of these needs?*

social policy A national government's course of action designed to promote the welfare of its citizens.

connecting development to life

Improving Family Policy

In the United States, the national government, state governments, and city governments all play a role in influencing the well-being of children (Children's Defense Fund, 2009). When families fail or seriously endanger a child's well-being, governments often step in to help. At the national and state levels, policy makers have debated for decades whether helping poor parents ends up helping their children as well. Researchers are providing some answers by examining the effects of specific policies (McLoyd & others, 2009).

For example, the Minnesota Family Investment Program (MFIP) was designed in the 1990s primarily to influence the behavior of adults—specifically, to move adults off the welfare rolls and into paid employment. A key element of the program was that it guaranteed that adults participating in the program would receive more income if they worked than if they did not. When the adults' income rose, how did that affect their children? A study of the effects of MFIP found that increases in the incomes of working poor parents were linked with benefits for their children (Gennetian & Miller, 2002). The children's achievement in school improved, and their behavior problems decreased. A current MFIP study is examining the influence of specific services on low-income families at risk for child maltreatment and other negative outcomes for children (Minnesota Family Investment Program, 2009).

Developmental psychologists and other researchers have examined the effects of many other government policies. They are seeking ways to help families living in poverty improve their well-being, and they have offered many suggestions for improving government policies (McLoyd & others, 2009).

Earlier, we learned that children who live in poverty experience higher levels of physiological stress. How might a child's stress level be affected by the implementation of MFIP?

years children spent living in poverty, the more their physiological indices of stress were elevated (Evans & Kim, 2007).

The U.S. figure of 17.4 percent of children living in poverty is much higher than those from other industrialized nations. For example, Canada has a child poverty rate of 9 percent and Sweden has a rate of 2 percent.

Edelman says that parenting and nurturing the next generation of children is our society's most important function and that we need to take it more seriously than we have in the past. To read about efforts to improve the lives of children through social policies, see *Connecting Development to Life* above.

Some children triumph over poverty or other adversities. They show *resilience* (Gutman, 2008). Think back to the chapter-opening story about Alice Walker. In spite of racism, poverty, her low socioeconomic status, and a disfiguring eye injury, she went on to become a successful author and champion for equality.

Are there certain characteristics that make children like Alice Walker resilient? Are there other characteristics that make children like Ted Kaczynski, who despite his intelligence and education, became a killer? After analyzing research on this topic, Ann Masten and her colleagues (2004, 2006, 2007, 2009a, b; Masten, Burt, & Coatsworth, 2006; Masten & others, 2009a, b) concluded that a number of individual factors, such as good intellectual functioning, influence resiliency. In addition, as Figure 1.5 shows, their families and extrafamilial contexts tend to show certain features. For example, resilient children are likely to have a close relationship to a caring parent figure and bonds to caring adults outside the family.

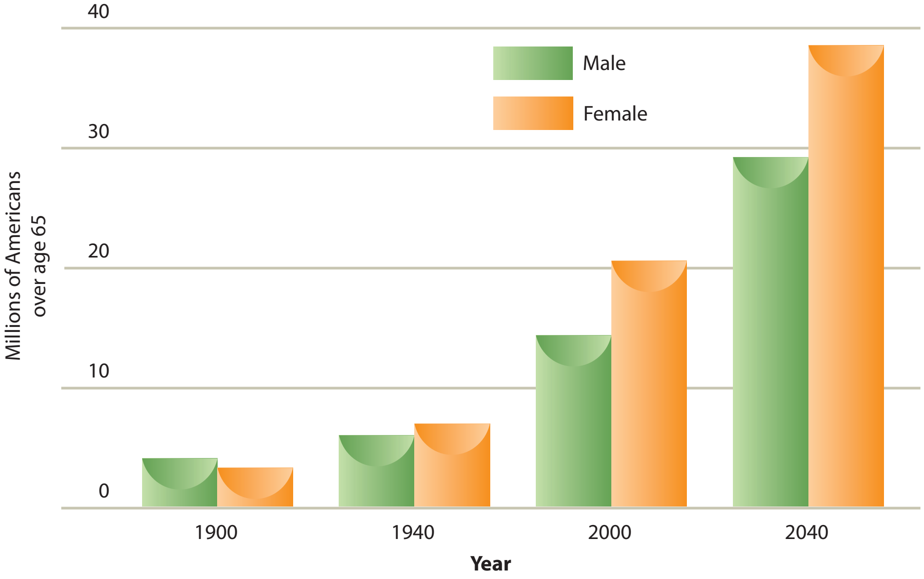
Source	Characteristic
Individual	Good intellectual functioning Appealing, sociable, easygoing disposition Self-confidence, high self-esteem Talents Faith
Family	Close relationship to caring parent figure Authoritative parenting: warmth, structure, high expectations Socioeconomic advantages Connections to extended supportive family networks
Extrafamilial Context	Bonds to caring adults outside the family Connections to positive organizations Attending effective schools

FIGURE **1.5**

CHARACTERISTICS OF RESILIENT CHILDREN AND THEIR CONTEXTS

FIGURE **1.6**

THE AGING OF AMERICA. The number of Americans over 65 has grown dramatically since 1900 and is projected to increase further from the present to the year 2040. A significant increase will also occur in the number of individuals in the 85-and-over group. Centenarians—persons 100 years of age or older—are the fastest-growing age group in the United States, and their numbers are expected to swell in the coming decades (Perls, 2007).



Maggie Kuhn is founder of the Gray Panthers, an international advocacy group that began in 1970 with five older women committed to improving the social conditions of older adults.

At the other end of the life span, the well-being of older adults also creates policy issues (Moody, 2009). Key concerns are escalating health care costs and the access of older adults to adequate health care (Ferrini & Ferrini, 2008). One study found that the health care system fails older adults in many areas (Wenger & others, 2003). For example, older adults received the recommended care for general medical conditions such as heart disease only 52 percent of the time; they received appropriate care for undernutrition and Alzheimer's disease only 31 percent of the time.

These concerns about the well-being of older adults are heightened by two facts. First, the number of older adults in the United States is growing dramatically, as Figure 1.6 shows. Second, many of these older Americans are likely to need society's help. Compared with earlier decades, U.S. adults today are less likely to be married, more likely to be childless, and more likely to be living alone. As the older population continues to expand in the 21st century, an increasing number of older adults will be without either a spouse or children—traditionally the main sources of support for older adults (Connidis, 2009). These individuals will need social relationships, networks, and supports (Knight & Sayegh, 2010).

Review *Connect* Reflect

LG1 Discuss the distinctive features of a life-span perspective on development.

Review

- What is meant by the concept of development? Why is the study of life-span development important?
- What are the main characteristics of the life-span perspective? What are three sources of contextual influences?
- What are some contemporary concerns in life-span development?

Connect

- Give your own example (not found in this chapter) of how biology, culture, and individual experience interact to affect development.

Reflect *Your Own Personal Journey of Life*

- Imagine what your development would have been like in a culture that offered fewer or distinctly different choices. How might your development have been different if your family had been significantly richer or poorer?

2 The Nature of Development

LG2 Identify the most important processes, periods, and issues in development.

Biological, Cognitive, and Socioemotional Processes
Periods of Development
The Significance of Age
Developmental Issues

In this section, we will explore what is meant by developmental processes and periods, as well as variations in the way age is conceptualized. We will examine key developmental issues and strategies we can use to evaluate them.

If you wanted to describe how and why Alice Walker or Ted Kaczynski developed during their lifetimes, how would you go about it? A chronicle of the events in any person's life can quickly become a confusing and tedious array of details. Two concepts help provide a framework for describing and understanding an individual's development: developmental processes and periods.

BIOLOGICAL, COGNITIVE, AND SOCIOEMOTIONAL PROCESSES

At the beginning of this chapter, we defined development as the pattern of change that begins at conception and continues through the life span. The pattern is complex because it is the product of biological, cognitive, and socioemotional processes (see Figure 1.7).

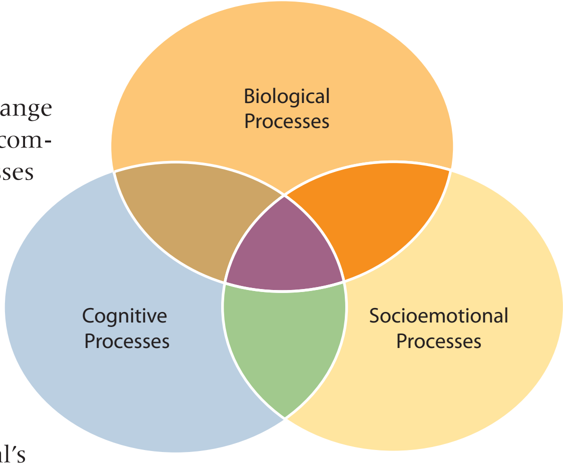


FIGURE **1.7**
PROCESSES INVOLVED IN DEVELOPMENTAL CHANGES. Biological, cognitive, and socioemotional processes interact as individuals develop.

Biological Processes

Biological processes produce changes in an individual's physical nature. Genes inherited from parents, the development of the brain, height and weight gains, changes in motor skills, nutrition, exercise, the hormonal changes of puberty, and cardiovascular decline are all examples of biological processes that affect development.

Cognitive Processes

Cognitive processes refer to changes in the individual's thought, intelligence, and language. Watching a colorful mobile swinging above the crib, putting together a two-word sentence, memorizing a poem, imagining what it would be like to be a movie star, and solving a crossword puzzle all involve cognitive processes.

Socioemotional Processes

Socioemotional processes involve changes in the individual's relationships with other people, changes in emotions, and changes in personality. An infant's smile in response to a parent's touch, a toddler's aggressive attack on a playmate, a school-age child's development of assertiveness, an adolescent's joy at the senior prom, and the affection of an elderly couple all reflect the role of socioemotional processes in development.

Connecting Biological, Cognitive, and Socioemotional Processes

Biological, cognitive, and socioemotional processes are inextricably intertwined (Diamond, 2009). Consider a baby smiling in response to a parent's touch. This response depends on biological processes (the physical nature of touch and responsiveness to it), cognitive processes (the ability to understand intentional acts), and socioemotional processes (the act of smiling that often reflects a positive emotional feeling and helps to connect us in positive ways with other human beings). Nowhere is the connection across biological, cognitive, and socioemotional processes more obvious than in two rapidly emerging fields:

- *developmental cognitive neuroscience*, which explores links between development, cognitive processes, and the brain (Diamond, Casey, & Munakata, 2011).

biological processes Changes in an individual's physical nature.

cognitive processes Changes in an individual's thought, intelligence, and language.

socioemotional processes Changes in an individual's relationships with other people, emotions, and personality.

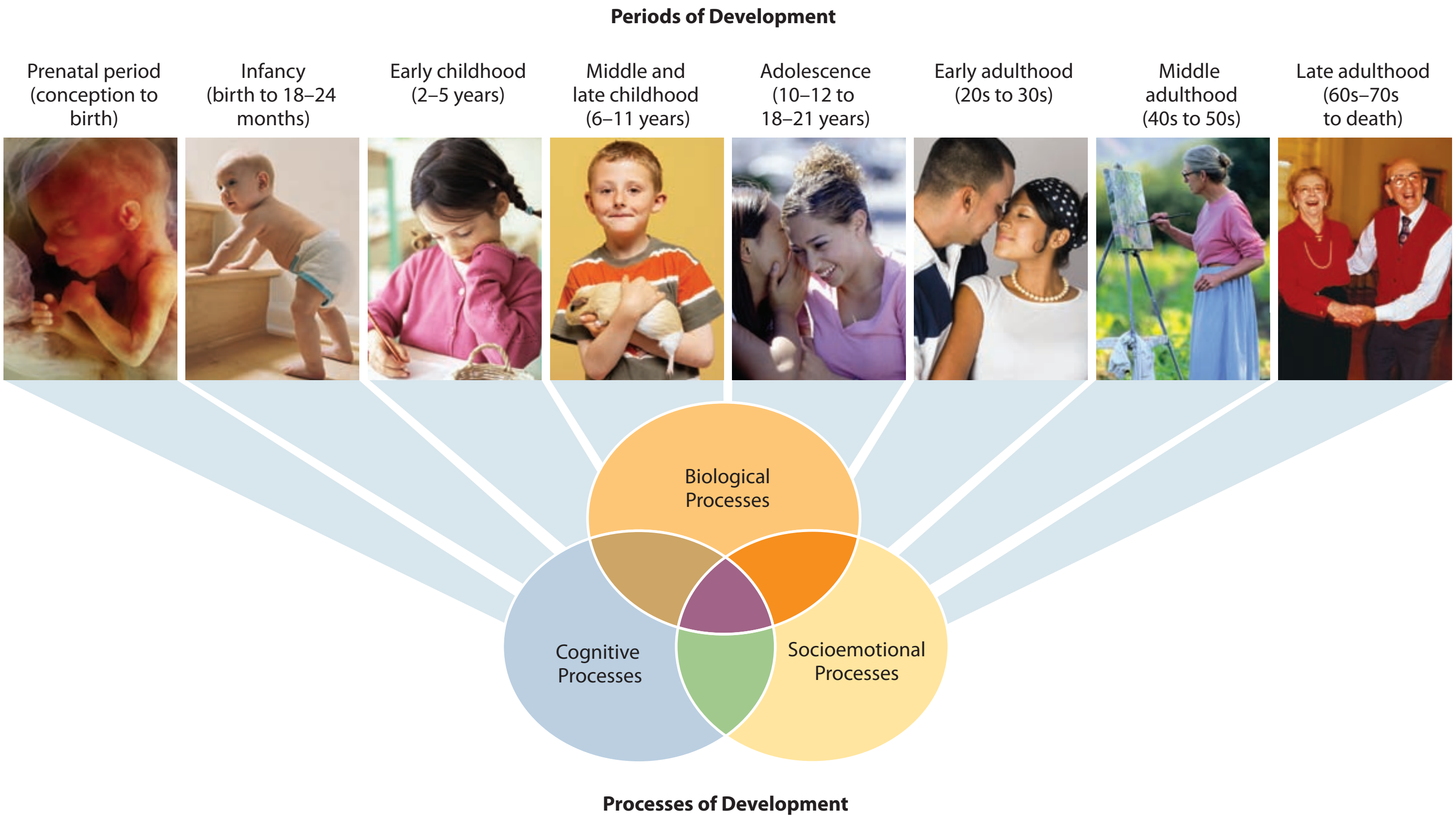

Periods of Development
Prenatal period (conception to birth)
Infancy (birth to 18–24 months)
Early childhood (2–5 years)
Middle and late childhood (6–11 years)
Adolescence (10–12 to 18–21 years)
Early adulthood (20s to 30s)
Middle adulthood (40s to 50s)
Late adulthood (60s–70s to death)
Biological Processes
Cognitive Processes
Socioemotional Processes
Processes of Development

FIGURE **1.8**

PROCESSES AND PERIODS OF DEVELOPMENT. The unfolding of life's periods of development is influenced by the interaction of biological, cognitive, and socioemotional processes.

developmental **connection**

Brain Development. Is there a link between changes in the adolescent's brain and their mood swings and increased risk taking? Chapter 11, p. 372

- *developmental social neuroscience*, which examines connections between socioemotional processes, development, and the brain (Calkins & Bell, 2010; de Haan & Gunnar, 2009).

In many instances, biological, cognitive, and socioemotional processes are bidirectional. For example, biological processes can influence cognitive processes and vice versa. Thus, although usually we will study the different processes of development (biological, cognitive, and socioemotional) in separate locations, keep in mind that we are talking about the development of an integrated individual with a mind and body that are interdependent. In many places throughout the book, we will call attention to these connections.

PERIODS OF DEVELOPMENT

The interplay of biological, cognitive, and socioemotional processes produces the periods of the human life span (see Figure 1.8). *A developmental period* refers to a time frame in a person's life that is characterized by certain features. For the purposes of organization and understanding, we commonly describe development in terms of these periods. The most widely used classification of developmental periods involves the eight-period sequence shown in Figure 1.8. Approximate age ranges are listed for the periods to provide a general idea of when a period begins and ends.

The prenatal period is the time from conception to birth. It involves tremendous growth—from a single cell to an organism complete with brain and behavioral capabilities—and takes place in approximately a nine-month period.

Infancy is the developmental period from birth to 18 or 24 months. Infancy is a time of extreme dependence upon adults. During this period, many psychological activities—language, symbolic thought, sensorimotor coordination, and social learning, for example—are just beginning.

Early childhood is the developmental period from the end of infancy to age 5 or 6. This period is sometimes called the "preschool years." During this time, young children learn to become more self-sufficient and to care for themselves, develop school readiness skills (following instructions, identifying letters), and spend many hours in play with peers. First grade typically marks the end of early childhood.

Middle and late childhood is the developmental period from about 6 to 11 years of age, approximately corresponding to the elementary school years. During this period, the fundamental skills of reading, writing, and arithmetic are mastered. The child is formally exposed to the larger world and its culture. Achievement becomes a more central theme of the child's world, and self-control increases.

Adolescence is the developmental period of transition from childhood to early adulthood, entered at approximately 10 to 12 years of age and ending at 18 to 21 years of age. Adolescence begins with rapid physical changes—dramatic gains in height and weight, changes in body contour, and the development of sexual characteristics such as enlargement of the breasts, growth of pubic and facial hair, and deepening of the voice. At this point in development, the pursuit of independence and an identity are prominent. Thought is more logical, abstract, and idealistic. More time is spent outside the family.

Early adulthood is the developmental period that begins in the early 20s and lasts through the 30s. It is a time of establishing personal and economic independence, career development, and for many, selecting a mate, learning to live with someone in an intimate way, starting a family, and rearing children.

Middle adulthood is the developmental period from approximately 40 years of age to about 60. It is a time of expanding personal and social involvement and responsibility; of assisting the next generation in becoming competent, mature individuals; and of reaching and maintaining satisfaction in a career.

Late adulthood is the developmental period that begins in the 60s or 70s and lasts until death. It is a time of life review, retirement, and adjustment to new social roles involving decreasing strength and health.

Late adulthood has the longest span of any period of development, and as noted earlier, the number of people in this age group has been increasing dramatically. As a result, life-span developmentalists have been paying more attention to differences within late adulthood (Scheibe, Freund, & Baltes, 2007). Paul Baltes and Jacqui Smith (2003) argue that a major change takes place in older adults' lives as they become the "oldest-old," on average at about 85 years of age. For example, the "young-old" (classified as 65 through 84 in this analysis) have substantial potential for physical and cognitive fitness, retain much of their cognitive capacity, and can develop strategies to cope with the gains and losses of aging. In contrast, the oldest-old (85 and older) show considerable loss in cognitive skills, experience an increase in chronic stress, and are more frail (Baltes & Smith, 2003).

Thus, Baltes and Smith concluded that considerable plasticity and adaptability characterize adults from their 60s until their mid-80s but that the oldest-old have reached the limits of their functional capacity, which makes interventions to improve their lives difficult. Nonetheless, as will be described in later chapters, considerable variation exists in how much the oldest-old retain their capabilities (Perls, 2007).

"This is the path to adulthood. You're here."

© Robert Weber/The New Yorker Collection/
www.cartoonbank.com

Four Ages Life-span developmentalists who focus on adult development and aging increasingly describe life-span development in terms of four "ages" (Baltes, 2006; Willis & Schaie, 2006):

First age: Childhood and adolescence

Second age: Prime adulthood, 20s through 50s

Third age: Approximately 60 to 79 years of age

Fourth age: Approximately 80 years and older

> One's children's children's children. Look back to us as we look to you; we are related by our imaginations. If we are able to touch, it is because we have imagined each other's existence, our dreams running back and forth along a cable from age to age.
>
> —Roger Rosenblatt
>
> *American Writer, 20th Century*

The major emphasis in this conceptualization is on the third and fourth ages, especially the increasing evidence that individuals in the third age are healthier and can lead more active, productive lives than their predecessors in earlier generations. However, when older adults reach their 80s, especially 85 and over (fourth age), health and well-being decline for many individuals.

Connections Across Periods of Development A final important point needs to be made about the periods of the human life span. Just as there are many connections between biological, cognitive, and socioemotional processes, so are there many connections between the periods of the human life span. A key aspect in the study of life-span development is how development in one period is connected to development in another period. For example, when individuals reach adolescence, think of all the many developments and experiences that have already taken place in their lives. For example, if an adolescent girl becomes depressed, might her depression be linked to development early in her life, as well as recent and current development? Throughout the text we will call attention to such connections across periods of development through Developmental Connections inserts that guide you to earlier or later connections of the material you are currently reading.

THE SIGNIFICANCE OF AGE

In our description of developmental periods, we linked an approximate age range with each period. But we also have noted that there are variations in the capabilities of individuals of the same age, and we have seen how changes with age can be exaggerated. How important is age when we try to understand an individual?

Age and Happiness Is one age in life better than another? When researchers have studied this question, consistent answers have not been forthcoming. Some studies of adults have indicated that happiness increases with age (Rodgers, 1982), others reveal no differences in happiness for adults of different ages (Inglehart, 1990), and yet others have found a U-shaped result with the lowest happiness occurring at 30 to 40 years of age (Mroczek & Kolarz, 1998). However, an increasing number of studies indicate that at least in the United States adults are happier as they age (Charles, Reynolds, & Gatz, 2001; Ehrlich & Isaacowitz, 2002). Consider a recent large-scale U.S. study of approximately 28,000 individuals from 18 to 88 that revealed happiness increased with age (Yang, 2008). For example, about 33 percent were very happy at 88 years of age compared with only about 24 percent in their late teens and early twenties. Why might older people report as much or more happiness and life satisfaction as younger people? Despite the increase in physical problems and losses older adults experience, they are more content with what they have in their lives, have better relationships with the people who matter to them, are less pressured to achieve, have more time for leisurely pursuits, and have many years of experience that may help them adapt to their circumstances with wisdom than younger adults do (Cornwell, Schumm, & Laumann, 2008; Ram & others, 2008). Also in the study, baby boomers (those born from 1946 to 1964) reported being less happy than individuals born earlier, possibly because they are not lowering their aspirations and idealistic hopes as they age as earlier generations did. Because growing older is a certain outcome of living, it is good to know that we are likely to be just as happy or happier as older adults as when we were younger.

Conceptions of Age According to some life-span experts, chronological age is not very relevant to understanding a person's psychological development (Botwinick, 1978). *Chronological age* is the number of years that have elapsed since birth. But time is a crude index of experience, and it does not cause anything. Chronological age, moreover, is not the only way of measuring age. Just as there are different domains of development, there are different ways of thinking about age.

(*Left*) Pam McSwain, 60, competing in the Senior Olympics in Memphis, Tennessee in 2009 (*right*) a sedentary, overweight middle-aged man. *Even if Pam McSwain's chronological age is older, might her biological age be younger than the middle-aged man's?*

Age has been conceptualized not just as chronological age but also as biological age, psychological age, and social age (Hoyer & Roodin, 2009). *Biological age* is a person's age in terms of biological health. Determining biological age involves knowing the functional capacities of a person's vital organs (Westendorp & Kirkwood, 2007). One person's vital capacities may be better or worse than those of others of comparable age. The younger the person's biological age, the longer the person is expected to live, regardless of chronological age.

Psychological age is an individual's adaptive capacities compared with those of other individuals of the same chronological age. Thus, older adults who continue to learn, are flexible, are motivated, have positive personality traits, control their emotions, and think clearly are engaging in more adaptive behaviors than their chronological age-mates who do not continue to learn, are rigid, are unmotivated, do not control their emotions, and do not think clearly (Depp, Vahia, & Jeste, 2010; Park & Huang, 2010). A longitudinal study of more than 1,200 individuals across seven decades revealed that the personality trait of conscientiousness (being organized, careful, and disciplined, for example) predicted lower mortality (frequency of death) risk from childhood through late adulthood (Martin, Friedman, & Schwartz, 2007).

How old would you be if you didn't know how old you were?

—Satchel Paige

American Baseball Pitcher, 20th Century

Social age refers to social roles and expectations related to a person's age (Phillipson & Baars, 2007). Consider the role of "mother" and the behaviors that accompany the role (Hoyer & Roodin, 2009). In predicting an adult woman's behavior, it may be more important to know that she is the mother of a 3-year-old child than to know whether she is 20 or 30 years old.

Life-span expert Bernice Neugarten (1988) argues that in U.S. society chronological age is becoming irrelevant. The 28-year-old mayor, the 35-year-old grandmother, the 65-year-old father of a preschooler, the 55-year-old widow who starts a business, and the 70-year-old student illustrate that old assumptions about the proper timing of life events no longer govern our lives. We still have some expectations for when certain life events—such as getting married, having children, and retiring—should occur. However, chronological age has become a less accurate predictor of these life events in our society. Moreover, issues such as how to deal with intimacy and how to cope with success and failure appear and reappear throughout the life span.

From a life-span perspective, an overall age profile of an individual involves not just chronological age but also biological age, psychological age, and social age. For example, a 70-year-old man (chronological age) might be in good physical health (biological age), be experiencing memory problems and not be coping well with the demands placed on him by his wife's recent hospitalization (psychological age), and have a number of friends with whom he regularly plays golf (social age).

developmental **connection**

Nature and Nurture. Can specific genes be linked to specific environmental experiences? Chapter 2, p. 74

DEVELOPMENTAL ISSUES

Was Ted Kaczynski born a killer, or did his life turn him into one? Kaczynski himself thought that his childhood was the root of his troubles. He grew up as a genius in a boy's body and never fit in with other children. Did his early experiences determine his later life? Is your own journey through life marked out ahead of time, or can your experiences change your path? Are the experiences you have early in your journey more important than later ones? Is your journey more like taking an elevator up a skyscraper with distinct stops along the way or more like a cruise down a river with smoother ebbs and flows? These questions point to three issues about the nature of development: the roles played by nature and nurture, stability and change, and continuity and discontinuity.

What is the nature of the early- and later-experience issue in development?

Nature and Nurture

The **nature-nurture issue** involves the extent to which development is influenced by nature and by nurture. Nature refers to an organism's biological inheritance, nurture to its environmental experiences.

According to those who emphasize the role of nature, just as a sunflower grows in an orderly way—unless flattened by an unfriendly environment—so too the human grows in an orderly way. An evolutionary and genetic foundation produces commonalities in growth and development (Brooker, 2011; Raven, 2011). We walk before we talk, speak one word before two words, grow rapidly in infancy and less so in early childhood, experience a rush of sex hormones in puberty, reach the peak of our physical strength in late adolescence and early adulthood, and then physically decline. Proponents of the importance of nature acknowledge that extreme environments—those that are psychologically barren or hostile—can depress development. However, they believe that basic growth tendencies are genetically programmed into humans (Mader, 2011).

By contrast, other psychologists emphasize the importance of nurture, or environmental experiences, in development (Kopp, 2011; Sandler, Wolchik, & Schoenfelder, 2011). Experiences run the gamut from the individual's biological environment (nutrition, medical care, drugs, and physical accidents) to the social environment (family, peers, schools, community, media, and culture).

developmental **connection**

Personality. How much does personality change as people go through the adult years? Chapter 16, p. 514

Stability and Change

Is the shy child who hides behind the sofa when visitors arrive destined to become a wallflower at college dances, or might the child become a sociable, talkative individual? Is the fun-loving, carefree adolescent bound to have difficulty holding down a 9-to-5 job as an adult? These questions reflect the **stability-change issue,** which involves the degree to which early traits and characteristics persist through life or change.

Many developmentalists who emphasize stability in development argue that stability is the result of heredity and possibly early experiences in life. For example, many argue that if an individual is shy throughout life (as Ted Kaczynski was), this stability is due to heredity and possibly early experiences in which the infant or young child encountered considerable stress when interacting with people.

Developmentalists who emphasize change take the more optimistic view that later experiences can produce change. Recall that in the life-span perspective, plasticity, the potential for change, exists throughout the life span. Experts such as Paul

nature-nurture issue Refers to the debate about whether development is primarily influenced by nature or nurture. Nature refers to an organism's biological inheritance, nurture to its environmental experiences. The "nature proponents" claim biological inheritance is the most important influence on development; the "nurture proponents" claim that environmental experiences are the most important.

stability-change issue Involves the degree to which we become older renditions of our early experience (stability) or whether we develop into someone different from who we were at an earlier point in development (change).

Baltes (2003) argue that with increasing age and on average older adults often show less capacity for change in the sense of learning new things than younger adults. However, many older adults continue to be good at practicing what they have learned in earlier times.

The roles of early and later experience are an aspect of the stability-change issue that has long been hotly debated (Phillips & Lowenstein, 2011; Schaie, 2010a, b). Some argue that unless infants experience warm, nurturant caregiving in the first year or so of life, their development will never be optimal (Berlin, Cassidy, & Appleyard, 2008). The later-experience advocates see children as malleable throughout development and later sensitive caregiving as equally important to earlier sensitive caregiving (Siegler & others, 2009).

Continuity and Discontinuity When developmental change occurs, is it gradual or abrupt? Think about your own development for a moment. Did you become the person you are gradually? Or did you experience sudden, distinct changes in your growth? For the most part, developmentalists who emphasize nurture describe development as a gradual, continuous process. Those who emphasize nature often describe development as a series of distinct stages.

The **continuity-discontinuity issue** focuses on the degree to which development involves either gradual, cumulative change (continuity) or distinct stages (discontinuity). In terms of continuity, as the oak grows from seedling to giant oak, it becomes more of an oak—its development is continuous (see Figure 1.9). Similarly, a child's first word, though seemingly an abrupt, discontinuous event, is actually the result of weeks and months of growth and practice. Puberty might seem abrupt, but it is a gradual process that occurs over several years.

In terms of discontinuity, as an insect grows from a caterpillar to a chrysalis to a butterfly, it passes through a sequence of stages in which change is qualitatively rather than quantitatively different. Similarly, at some point a child moves from not being able to think abstractly about the world to being able to. This is a qualitative, discontinuous change in development rather than a quantitative, continuous change.

Evaluating the Developmental Issues Most life-span developmentalists acknowledge that development is not all nature or all nurture, not all stability or all change, and not all continuity or all discontinuity (Staudinger & Gluck, 2011). Nature and nurture, stability and change, continuity and discontinuity characterize development throughout the human life span.

Although most developmentalists do not take extreme positions on these three important issues, there is spirited debate regarding how strongly development is influenced by each of these factors (Goldsmith, 2011; Phillips & Lowenstein, 2011).

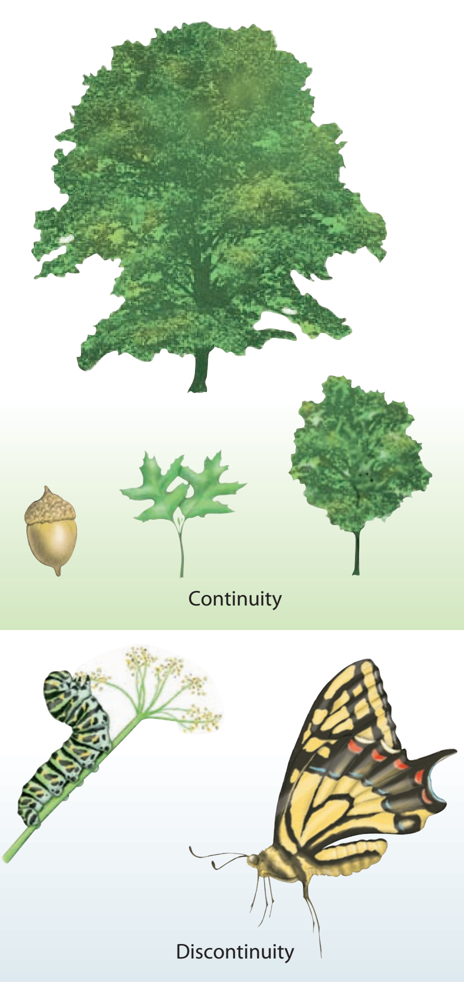


FIGURE **1.9**

CONTINUITY AND DISCONTINUITY IN DEVELOPMENT. *Is our development like that of a seedling gradually growing into a giant oak? Or is it more like that of a caterpillar suddenly becoming a butterfly?*

continuity-discontinuity issue Focuses on the extent to which development involves gradual, cumulative change (continuity) or distinct stages (discontinuity).

Review *Connect* Reflect

LG2 Identify the most important processes, periods, and issues in development.

Review

- What are three key developmental processes?
- What are eight main developmental periods?
- How is age related to development?
- What are three main developmental issues?

Connect

- In the previous section, we discussed biological, cognitive, and socioemotional processes. What concepts do these processes have in common with the issue of nature vs. nurture also discussed in this section?

Reflect *Your Own Personal Journey of Life*

- Do you think there was/is/will be a best age for you to be? If so, what is it? Why?

3 Theories of Development

LG3 Describe the main theories in human development.

- Psychoanalytic Theories
- Cognitive Theories
- Behavioral and Social Cognitive Theories
- Ethological Theory
- Ecological Theory
- An Eclectic Theoretical Orientation

> There is nothing quite so practical as a good theory.
>
> —Kurt Lewin
>
> *American Social Psychologist, 20th Century*

How can we answer questions about the roles of nature and nurture, stability and change, and continuity and discontinuity in development? How can we determine, for example, whether memory declines in older adults can be prevented or whether special care can repair the harm inflicted by child neglect? The scientific method is the best tool we have to answer such questions.

The **scientific method** is essentially a four-step process: (1) Conceptualize a process or problem to be studied, (2) collect research information (data), (3) analyze data, and (4) draw conclusions.

In step 1, when researchers are formulating a problem to study, they often draw on theories and develop hypotheses. A **theory** is an interrelated, coherent set of ideas that helps to explain phenomena and make predictions. It may suggest **hypotheses,** which are specific assertions and predictions that can be tested. For example, a theory on mentoring might state that sustained support and guidance from an adult makes a difference in the lives of children from impoverished backgrounds because the mentor gives the children opportunities to observe and imitate the behavior and strategies of the mentor.

This section outlines key aspects of five theoretical orientations to development: psychoanalytic, cognitive, behavioral and social cognitive, ethological, and ecological. Each contributes an important piece to the life-span development puzzle. Although the theories disagree about certain aspects of development, many of their ideas are complementary rather than contradictory. Together they let us see the total landscape of life-span development in all its richness.

Sigmund Freud, the pioneering architect of psychoanalytic theory. *How did Freud portray the organization of an individual's personality?*

PSYCHOANALYTIC THEORIES

Psychoanalytic theories describe development as primarily unconscious (beyond awareness) and heavily colored by emotion. Psychoanalytic theorists emphasize that behavior is merely a surface characteristic and that a true understanding of development requires analyzing the symbolic meanings of behavior and the deep inner workings of the mind. Psychoanalytic theorists also stress that early experiences with parents extensively shape development. These characteristics are highlighted in the main psychoanalytic theory, that of Sigmund Freud (1856–1939).

Freud's Theory As Freud listened to, probed, and analyzed his patients, he became convinced that their problems were the result of experiences early in life. He thought that as children grow up, their focus of pleasure and sexual impulses shifts from the mouth to the anus and eventually to the genitals. As a result, we go through five stages of psychosexual development: oral, anal, phallic, latency, and genital (see Figure 1.10). Our adult personality, Freud (1917) claimed, is determined by the way we resolve conflicts between sources of pleasure at each stage and the demands of reality.

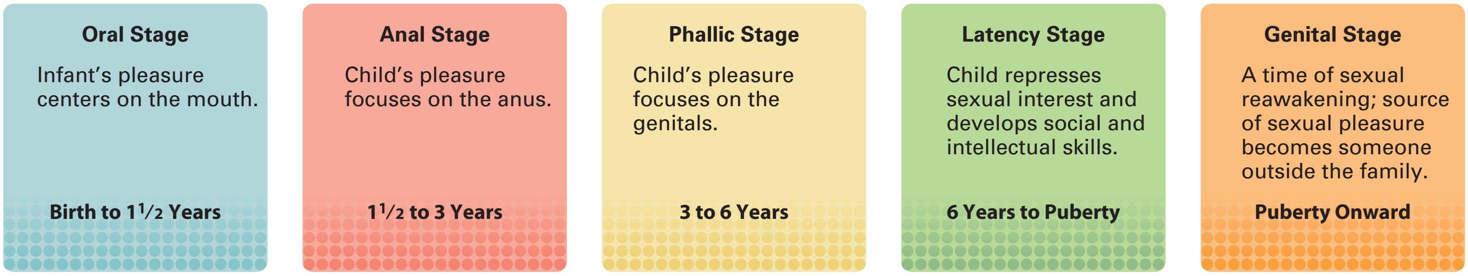
Freud's theory has been significantly revised by a number of psychoanalytic theorists. Many of today's psychoanalytic theorists maintain that Freud overemphasized sexual instincts; they place more emphasis on cultural experiences as determinants of an individual's development. Unconscious thought remains a central theme, but thought plays a greater role than Freud envisioned. Next, we will outline the ideas of an important revisionist of Freud's ideas—Erik Erikson.

scientific method An approach that can be used to obtain accurate information. It includes these steps: (1) conceptualize the problem, (2) collect data, (3) draw conclusions, and (4) revise research conclusions and theory.

theory An interrelated, coherent set of ideas that helps to explain and make predictions.

hypotheses Specific assumptions and predictions that can be tested to determine their accuracy.

psychoanalytic theories Describe development as primarily unconscious and heavily colored by emotion. Behavior is merely a surface characteristic, and the symbolic workings of the mind have to be analyzed to understand behavior. Early experiences with parents are emphasized.



Oral Stage
Infant's pleasure centers on the mouth.
Birth to $1\frac{1}{2}$ Years

Anal Stage
Child's pleasure focuses on the anus.
$1\frac{1}{2}$ to 3 Years

Phallic Stage
Child's pleasure focuses on the genitals.
3 to 6 Years

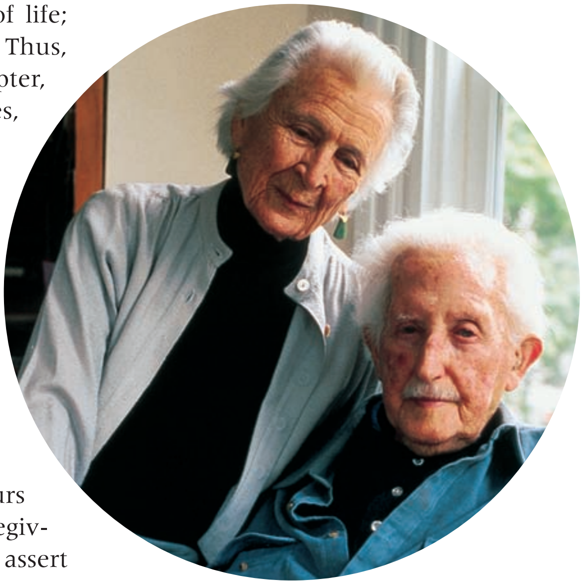
Latency Stage
Child represses sexual interest and develops social and intellectual skills.
6 Years to Puberty

Genital Stage
A time of sexual reawakening; source of sexual pleasure becomes someone outside the family.
Puberty Onward

FIGURE **1.10**

FREUDIAN STAGES. Because Freud emphasized sexual motivation, his stages of development are known as *psychosexual stages*. In his view, if the need for pleasure at any stage is either undergratified or overgratified, an individual may become *fixated*, or locked in, at that stage of development.

Erikson's Psychosocial Theory Erik Erikson (1902–1994) recognized Freud's contributions but believed that Freud misjudged some important dimensions of human development. For one thing, Erikson (1950, 1968) said we develop in psychosocial stages, rather than in psychosexual stages, as Freud maintained. According to Freud, the primary motivation for human behavior is sexual in nature; according to Erikson, it is social and reflects a desire to affiliate with other people. According to Freud, our basic personality is shaped in the first five years of life; according to Erikson, developmental change occurs throughout the life span. Thus, in terms of the early-versus-later-experience issue described earlier in the chapter, Freud viewed early experience as far more important than later experiences, whereas Erikson emphasized the importance of both early and later experiences.



Erik Erikson with his wife, Joan, an artist. Erikson generated one of the most important developmental theories of the 20th century. *Which stage of Erikson's theory are you in? Does Erikson's description of this stage characterize you?*

In **Erikson's theory,** eight stages of development unfold as we go through life (see Figure 1.11). At each stage, a unique developmental task confronts individuals with a crisis that must be resolved. According to Erikson, this crisis is not a catastrophe but a turning point marked by both increased vulnerability and enhanced potential. The more successfully an individual resolves the crises, the healthier development will be.

Trust versus mistrust is Erikson's first psychosocial stage, which is experienced in the first year of life. Trust in infancy sets the stage for a lifelong expectation that the world will be a good and pleasant place to live.

Autonomy versus shame and doubt is Erikson's second stage. This stage occurs in late infancy and toddlerhood (1 to 3 years). After gaining trust in their caregivers, infants begin to discover that their behavior is their own. They start to assert their sense of independence or autonomy. They realize their will. If infants and toddlers are restrained too much or punished too harshly, they are likely to develop a sense of shame and doubt.

Initiative versus guilt, Erikson's third stage of development, occurs during the preschool years. As preschool children encounter a widening social world, they face new challenges that require active, purposeful, responsible behavior. Feelings of guilt may arise, though, if the child is irresponsible and is made to feel too anxious.

Industry versus inferiority is Erikson's fourth developmental stage, occurring approximately in the elementary school years. Children now need to direct their energy toward mastering knowledge and intellectual skills. The negative outcome is that the child may develop a sense of inferiority—feeling incompetent and unproductive.

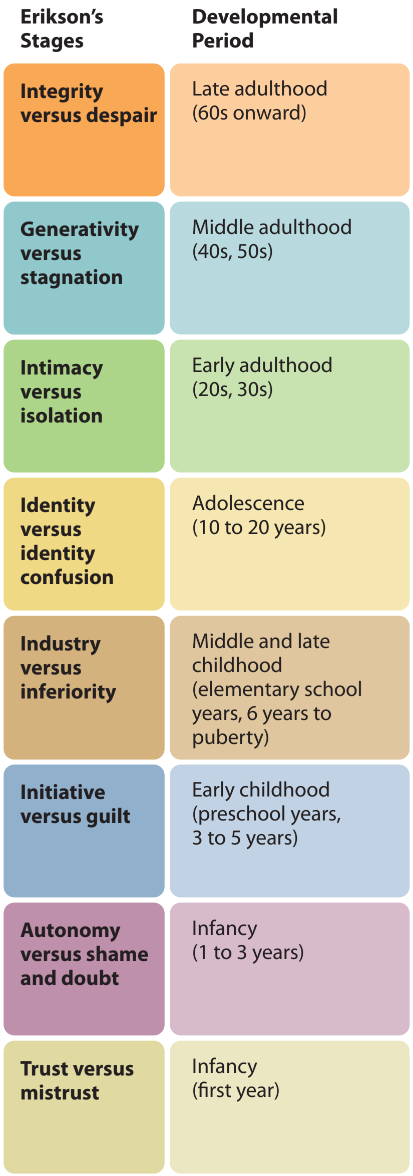
During the adolescent years, individuals face finding out who they are, what they are all about, and where they are going in life. This is Erikson's fifth developmental stage, *identity versus identity confusion*. If adolescents explore roles in a healthy manner and arrive at a positive path to follow in life, then they achieve a positive identity; if not, then identity confusion reigns.

Intimacy versus isolation is Erikson's sixth developmental stage, which individuals experience during the early adulthood years. At this time, individuals face the

developmental **connection**

Culture. What characterizes an adolescent's ethnic identity? Chapter 12, p. 385

Erikson's theory Includes eight stages of human development. Each stage consists of a unique developmental task that confronts individuals with a crisis that must be resolved.



Erikson's Stages	Developmental Period
Integrity versus despair	Late adulthood (60s onward)
Generativity versus stagnation	Middle adulthood (40s, 50s)
Intimacy versus isolation	Early adulthood (20s, 30s)
Identity versus identity confusion	Adolescence (10 to 20 years)
Industry versus inferiority	Middle and late childhood (elementary school years, 6 years to puberty)
Initiative versus guilt	Early childhood (preschool years, 3 to 5 years)
Autonomy versus shame and doubt	Infancy (1 to 3 years)
Trust versus mistrust	Infancy (first year)

FIGURE **1.11**

ERIKSON'S EIGHT LIFE-SPAN STAGES. Like Freud, Erikson proposed that individuals go through distinct, universal stages of development. Thus, in terms of the continuity-discontinuity issue discussed in this chapter, both favor the discontinuity side of the debate. Notice that the timing of Erikson's first four stages is similar to that of Freud's stages. *What are the implications of saying that people go through stages of development?*

developmental task of forming intimate relationships. If young adults form healthy friendships and an intimate relationship with another, intimacy will be achieved; if not, isolation will result.

Generativity versus stagnation, Erikson's seventh developmental stage occurs during middle adulthood. By generativity Erikson means primarily a concern for helping the younger generation to develop and lead useful lives. The feeling of having done nothing to help the next generation is stagnation.

Integrity versus despair is Erikson's eighth and final stage of development, which individuals experience in late adulthood. During this stage, a person reflects on the past. If the person's life review reveals a life well spent, integrity will be achieved; if not, the retrospective glances likely will yield doubt or gloom—the despair Erikson described.

Evaluating Psychoanalytic Theories Contributions of psychoanalytic theories include an emphasis on a developmental framework, family relationships, and unconscious aspects of the mind. Criticisms include a lack of scientific support, too much emphasis on sexual underpinnings, and an image of people that is too negative.

COGNITIVE THEORIES

Whereas psychoanalytic theories stress the importance of the unconscious, cognitive theories emphasize conscious thoughts. Three important cognitive theories are Piaget's cognitive developmental theory, Vygotsky's sociocultural cognitive theory, and the information-processing theory.

Piaget's Cognitive Developmental Theory **Piaget's theory** states that children go through four stages of cognitive development as they actively construct their understanding of the world. Two processes underlie this cognitive construction of the world: organization and adaptation. To make sense of our world, we organize our experiences (Carpendale, Muller, & Bibok, 2008). For example, we separate important ideas from less important ideas, and we connect one idea to another. In addition to organizing our observations and experiences, we adapt, adjusting to new environmental demands (Byrnes, 2008).

Jean Piaget, the famous Swiss developmental psychologist, changed the way we think about the development of children's minds. *What are some key ideas in Piaget's theory?*

Piaget's theory States that children actively construct their understanding of the world and go through four stages of cognitive development.

Piaget (1954) also held that we go through four stages in understanding the world (see Figure 1.12). Each stage is age-related and consists of a distinct way of thinking, a different way of understanding the world. Thus, according to Piaget (1896–1980), the child's cognition is qualitatively different in one stage compared with another. What are Piaget's four stages of cognitive development?

- The *sensorimotor stage*, which lasts from birth to about 2 years of age, is the first Piagetian stage. In this stage, infants construct an understanding of the world by coordinating sensory experiences (such as seeing and hearing) with physical, motoric actions—hence the term *sensorimotor*.
- The *preoperational stage*, which lasts from approximately 2 to 7 years of age, is Piaget's second stage. In this stage, children begin to go beyond simply connecting sensory information with physical action and represent the world with words,

Sensorimotor Stage

The infant constructs an understanding of the world by coordinating sensory experiences with physical actions. An infant progresses from reflexive, instinctual action at birth to the beginning of symbolic thought toward the end of the stage.

Birth to 2 Years of Age

Preoperational Stage

The child begins to represent the world with words and images. These words and images reflect increased symbolic thinking and go beyond the connection of sensory information and physical action.

2 to 7 Years of Age

Concrete Operational Stage

The child can now reason logically about concrete events and classify objects into different sets.

7 to 11 Years of Age

Formal Operational Stage

The adolescent reasons in more abstract, idealistic, and logical ways.

11 Years of Age Through Adulthood

FIGURE **1.12**

PIAGET'S FOUR STAGES OF COGNITIVE DEVELOPMENT. According to Piaget, how a child thinks—not how much the child knows—determines the child's stage of cognitive development.

images, and drawings. However, according to Piaget, preschool children still lack the ability to perform what he calls operations, which are internalized mental actions that allow children to do mentally what they previously could only do physically. For example, if you imagine putting two sticks together to see whether they would be as long as another stick, without actually moving the sticks, you are performing a concrete operation.

- The *concrete operational stage*, which lasts from approximately 7 to 11 years of age, is the third Piagetian stage. In this stage, children can perform operations that involve objects, and they can reason logically when the reasoning can be applied to specific or concrete examples. For instance, concrete operational thinkers cannot imagine the steps necessary to complete an algebraic equation, which is too abstract for thinking at this stage of development.
- The *formal operational stage*, which appears between the ages of 11 and 15 and continues through adulthood, is Piaget's fourth and final stage. In this stage, individuals move beyond concrete experiences and think in abstract and more logical terms. As part of thinking more abstractly, adolescents develop images of ideal circumstances. They might think about what an ideal parent is like and compare their parents to this ideal standard. They begin to entertain possibilities for the future and are fascinated with what they can be. In solving problems, they become more systematic, developing hypotheses about why something is happening the way it is and then testing these hypotheses. We will examine Piaget's cognitive developmental theory further in Chapters 5, 7, 9, and 11.

Vygotsky's Sociocultural Cognitive Theory Like Piaget, the Russian developmentalist Lev Vygotsky (1896–1934) argued that children actively construct their

Lev Vygotsky was born the same year as Piaget, but he died much earlier, at the age of 37. There is considerable interest today in Vygotsky's sociocultural cognitive theory of child development. *What are some key characteristics of Vygotsky's theory?*

knowledge. However, Vygotsky (1962) gave social interaction and culture far more important roles in cognitive development than Piaget did. **Vygotsky's theory** is a sociocultural cognitive theory that emphasizes how culture and social interaction guide cognitive development.

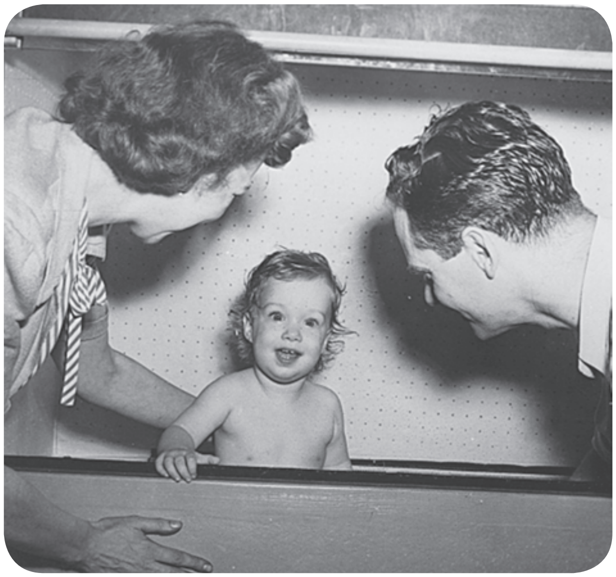
Vygotsky portrayed the child's development as inseparable from social and cultural activities (Gauvain & Parke, 2010). He maintained that cognitive development involves learning to use the inventions of society, such as language, mathematical systems, and memory strategies. Thus in one culture, children might learn to count with the help of a computer; in another, they might learn by using beads. According to Vygotsky, children's social interaction with more-skilled adults and peers is indispensable to their cognitive development (Holzman, 2009). Through this interaction, they learn to use the tools that will help them adapt and be successful in their culture (Gauvain & Parke, 2010). In Chapter 7, we examine ideas about learning and teaching that are based on Vygotsky's theory.

Early computers may be the best candidates for the title of "founding fathers" of information-processing theory. Although many factors stimulated the growth of this theory, none was more important than the computer. Psychologists began to wonder if the logical operations carried out by computers might tell us something about how the human mind works. They drew analogies between a computer's hardware and the brain and between computer software and cognition.

The Information-Processing Theory **Information-processing theory** emphasizes that individuals manipulate information, monitor it, and strategize about it. Unlike Piaget's theory, but like Vygotsky's theory, information-processing theory does not describe development as stage-like. Instead, according to this theory, individuals develop a gradually increasing capacity for processing information, which allows them to acquire increasingly complex knowledge and skills (Sternberg, 2010a, b).

Robert Siegler (2006, 2007), a leading expert on children's information processing, states that thinking is information processing. In other words, when individuals perceive, encode, represent, store, and retrieve information, they are thinking. Siegler emphasizes that an important aspect of development is learning good strategies for processing information. For example, becoming a better reader might involve learning to monitor the key themes of the material being read.

Evaluating Cognitive Theories Contributions of cognitive theories include a positive view of development and an emphasis on the active construction of understanding. Criticisms include skepticism about the pureness of Piaget's stages and too little attention to individual variations.



B. F. Skinner was a tinkerer who liked to make new gadgets. The younger of his two daughters, Deborah, was raised in Skinner's enclosed Air-Crib, which he invented because he wanted to control her environment completely. The Air-Crib was sound-proofed and temperature controlled. Debbie, shown here as a child with her parents, is currently a successful artist, is married, and lives in London. *What do you think about Skinner's Air-Crib?*

BEHAVIORAL AND SOCIAL COGNITIVE THEORIES

Behaviorism essentially holds that we can study scientifically only what can be directly observed and measured. Out of the behavioral tradition grew the belief that development is observable behavior that can be learned through experience with the environment (Klein, 2009). In terms of the continuity-discontinuity issue discussed earlier in this chapter, the behavioral and social cognitive theories emphasize continuity in development and argue that development does not occur in stage-like fashion. Let's explore two versions of behaviorism: Skinner's operant conditioning and Bandura's social cognitive theory.

Skinner's Operant Conditioning According to B. F. Skinner (1904–1990), through operant conditioning the consequences of a behavior produce changes in the probability of the behavior's occurrence. A behavior followed by a rewarding stimulus is more likely to recur, whereas a behavior followed by a punishing stimulus is less likely to recur. For example, when an adult smiles at a child after the child has done something, the child is more likely to engage in that behavior again than if the adult gives the child a disapproving look.

Vygotsky's theory A sociocultural cognitive theory that emphasizes how culture and social interaction guide cognitive development.

information-processing theory Emphasizes that individuals manipulate information, monitor it, and strategize about it. Central to this theory are the processes of memory and thinking.

In Skinner's (1938) view, such rewards and punishments shape development. For Skinner the key aspect of development is behavior, not thoughts and feelings. He emphasized that development consists of the pattern of behavioral changes that are brought about by rewards and punishments. For example, Skinner would say that shy people learned to be shy as a result of experiences they had while growing up. It follows that modifications in an environment can help a shy person become more socially oriented.

Bandura's Social Cognitive Theory Some psychologists agree with the behaviorists' notion that development is learned and is influenced strongly by environmental interactions. However, unlike Skinner, they also see cognition as important in understanding development (Mischel, 2004). **Social cognitive theory** holds that behavior, environment, and cognition are the key factors in development.

American psychologist Albert Bandura (1925–) is the leading architect of social cognitive theory. Bandura (1986, 2004, 2007, 2008, 2009, 2010a, b) emphasizes that cognitive processes have important links with the environment and behavior. His early research program focused heavily on observational learning (also called imitation or modeling), which is learning that occurs through observing what others do. For example, a young boy might observe his father yelling in anger and treating other people with hostility; with his peers, the young boy later acts very aggressively, showing the same characteristics as his father's behavior. Social cognitive theorists stress that people acquire a wide range of behaviors, thoughts, and feelings through observing others' behavior and that these observations form an important part of life-span development.

What is cognitive about observational learning in Bandura's view? He proposes that people cognitively represent the behavior of others and then sometimes adopt this behavior themselves.

Bandura's (2004, 2007, 2008, 2009, 2010a, b) most recent model of learning and development includes three elements: behavior, the person/cognition, and the environment. An individual's confidence that he or she can control his or her success is an example of a person factor; strategies are an example of a cognitive factor. As shown in Figure 1.13, behavior, person/cognitive, and environmental factors operate interactively.

Evaluating Behavioral and Social Cognitive Theories Contributions of the behavioral and social cognitive theories include an emphasis on scientific research and environmental determinants of behavior. Criticisms include too little emphasis on cognition in Skinner's view and giving inadequate attention to developmental changes.

ETHOLOGICAL THEORY

Ethology stresses that behavior is strongly influenced by biology, is tied to evolution, and is characterized by critical or sensitive periods. These are specific time frames during which, according to ethologists, the presence or absence of certain experiences has a long-lasting influence on individuals.

European zoologist Konrad Lorenz (1903–1989) helped bring ethology to prominence. In his best-known research, Lorenz (1965) studied the behavior of greylag geese, which will follow their mothers as soon as they hatch. Lorenz separated the eggs laid by one goose into two groups. One group he returned to the goose to be hatched by her. The other group was hatched in an incubator. The goslings in the first group performed as predicted. They followed their mother as soon as they hatched. However, those in the second group, which saw Lorenz when they first hatched, followed him everywhere, as though he were their mother. Lorenz marked the goslings and then placed both groups under a box. Mother goose and "mother" Lorenz stood aside as the box lifted. Each group of goslings went directly to its

Albert Bandura has been one of the leading architects of social cognitive theory. *How does Bandura's theory differ from Skinner's?*

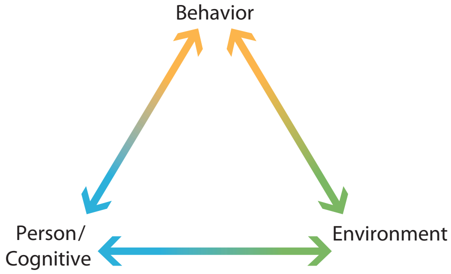


FIGURE **1.13**

BANDURA'S SOCIAL COGNITIVE MODEL. The arrows illustrate how relations between behavior, person/cognitive, and environment are reciprocal rather than one way. *Person/cognitive* refers to cognitive processes (for example, thinking and planning) and personal characteristics (for example, believing that you can control your experiences).

developmental **connection**

Achievement. Bandura emphasizes that self-efficacy is a key person/cognitive factor in children's achievement. Chapter 10, p. 316

social cognitive theory The view of psychologists who emphasize behavior, environment, and cognition as the key factors in development.

ethology Stresses that behavior is strongly influenced by biology, is tied to evolution, and is characterized by critical or sensitive periods.

Konrad Lorenz, a pioneering student of animal behavior, is followed through the water by three imprinted greylag geese. Describe Lorenz's experiment with the geese. *Do you think his experiment would have the same results with human babies? Explain.*

"mother." Lorenz called this process imprinting, the rapid, innate learning that involves attachment to the first moving object seen.

John Bowlby (1969, 1989) illustrated an important application of ethological theory to human development. Bowlby stressed that attachment to a caregiver over the first year of life has important consequences throughout the life span. In his view, if this attachment is positive and secure, the individual will likely develop positively in childhood and adulthood. If the attachment is negative and insecure, life-span development will likely not be optimal. In Chapter 6, we will explore the concept of infant attachment in much greater detail.

developmental **connection**

Attachment. Human babies go through a series of phases in developing an attachment to a caregiver. Chapter 6, p. 191

In Lorenz's view, imprinting needs to take place at a certain, very early time in the life of the animal, or else it will not take place. This point in time is called a critical period. A related concept is that of a sensitive period, and an example of this is the time during infancy when, according to Bowlby, attachment should occur in order to promote optimal development of social relationships.

Another theory that emphasizes biological foundations of development—evolutionary psychology—will be presented in Chapter 2, along with views on the role of heredity in development. In addition, we will examine a number of biological theories of aging in Chapter 17.

Evaluating Ethological Theory Contributions of ethological theory include a focus on the biological and evolutionary basis of development, and the use of careful observations in naturalistic settings. Criticisms include too much emphasis on biological foundations and a belief that the critical and sensitive period concepts might be too rigid.

ECOLOGICAL THEORY

developmental **connection**

Parenting. How are parent-child relationships and children's peer relations linked? Chapter 8, p. 266

While ethological theory stresses biological factors, ecological theory emphasizes environmental factors. One ecological theory that has important implications for understanding life-span development was created by Urie Bronfenbrenner (1917–2005). **Bronfenbrenner's ecological theory** (Bronfenbrenner, 1986, 2004; Bronfenbrenner & Morris, 1998, 2006) holds that development reflects the influence of several environmental systems. The theory identifies five environmental systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem (see Figure 1.14).

Bronfenbrenner's ecological theory Bronfenbrenner's environmental systems theory that focuses on five environmental systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

The *microsystem* is the setting in which the individual lives. These contexts include the person's family, peers, school, and neighborhood. It is in the microsystem that the most direct interactions with social agents take place—with parents, peers, and teachers, for example. The individual is not a passive recipient of experiences in these settings, but someone who helps to construct the settings.

The *mesosystem* involves relations between microsystems or connections between contexts. Examples are the relation of family experiences to school experiences, school experiences to religious experiences, and family experiences to peer experiences. For example, children whose parents have rejected them may have difficulty developing positive relations with teachers.

The *exosystem* consists of links between a social setting in which the individual does not have an active role and the individual's immediate context. For example, a husband's or child's experience at home may be influenced by a mother's experiences at work. The mother might receive a promotion that requires more travel, which might increase conflict with the husband and change patterns of interaction with the child.

The *macrosystem* involves the culture in which individuals live. Remember from earlier in the chapter that culture refers to the behavior patterns, beliefs, and all other products of a group of people that are passed on from generation to generation. Remember also that cross-cultural studies—the comparison of one culture with one or more other cultures—provide information about the generality of development.

The *chronosystem* consists of the patterning of environmental events and transitions over the life course, as well as sociohistorical circumstances. For example, divorce is one transition. Researchers have found that the negative effects of divorce on children often peak in the first year after the divorce (Hetherington, 1993, 2006). By two years after the divorce, family interaction is more stable. As an example of sociohistorical circumstances, consider how the opportunities for women to pursue a career have increased since the 1960s.

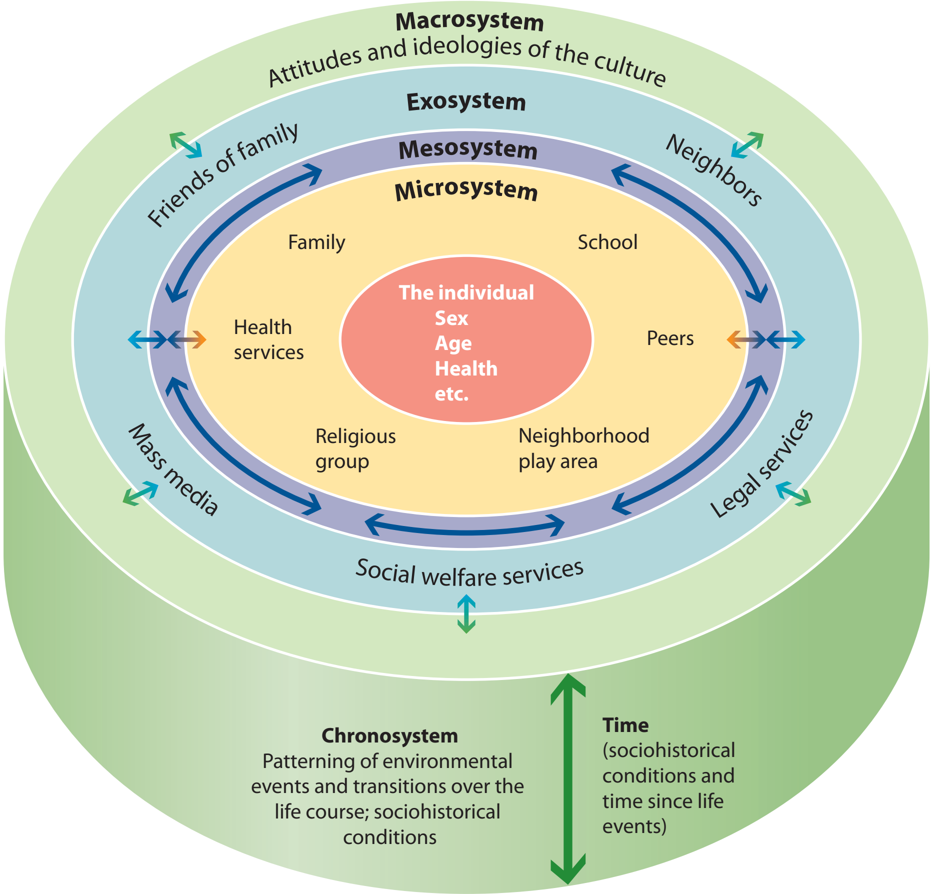

Macrosystem
Attitudes and ideologies of the culture
Exosystem
Friends of family
Neighbors
Mesosystem
Microsystem
Family
School
The individual
Sex
Age
Health
etc.
Health services
Peers
Religious group
Neighborhood play area
Mass media
Legal services
Social welfare services
Chronosystem
Patterning of environmental events and transitions over the life course; sociohistorical conditions
Time
(sociohistorical conditions and time since life events)

FIGURE **1.14**

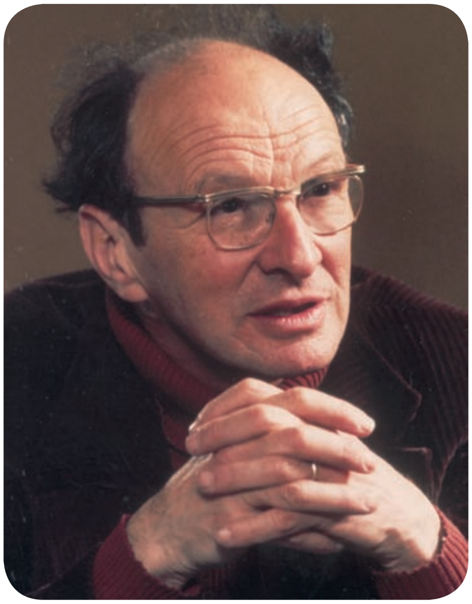
BRONFENBRENNER'S ECOLOGICAL THEORY OF DEVELOPMENT. Bronfenbrenner's ecological theory consists of five environmental systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

Bronfenbrenner (2004; Bronfenbrenner & Morris, 2006) subsequently added biological influences to his theory, describing it as a bioecological theory. Nonetheless, it is still dominated by ecological, environmental contexts (Ceci, 2000).

Evaluating Ecological Theory Contributions of the theory include a systematic examination of macro and micro dimensions of environmental systems, and attention to connections between environmental systems. A further contribution of Bronfenbrenner's theory is an emphasis on a range of social contexts beyond the family, such as neighborhood, religion, school, and workplace, as influential in children's development (Gauvain & Parke, 2010). Criticisms include giving inadequate attention to biological factors, as well as too little emphasis on cognitive factors.

AN ECLECTIC THEORETICAL ORIENTATION

No single theory described in this chapter can explain entirely the rich complexity of life-span development, but each has contributed to our understanding of development. Psychoanalytic theory best explains the unconscious mind. Erikson's theory best describes the changes that occur in adult development. Piaget's, Vygotsky's, and the information-processing views provide the most complete description of cognitive development. The behavioral and social cognitive and ecological theories have been the most adept at examining the environmental determinants of development. The



Urie Bronfenbrenner developed ecological theory, a perspective that is receiving increased attention today. His theory emphasizes the importance of both micro and macro dimensions of the environment in which the child lives.

THEORY	ISSUES	
	Continuity/discontinuity, early versus later experiences	**Biological and environmental factors**
Psychoanalytic	Discontinuity between stages—continuity between early experiences and later development; early experiences very important; later changes in development emphasized in Erikson's theory	Freud's biological determination interacting with early family experiences; Erikson's more balanced biological-cultural interaction perspective
Cognitive	Discontinuity between stages in Piaget's theory; continuity between early experiences and later development in Piaget's and Vygotsky's theories; no stages in Vygotsky's theory or information-processing theory	Piaget's emphasis on interaction and adaptation; environment provides the setting for cognitive structures to develop; information-processing view has not addressed this issue extensively but mainly emphasizes biological-environmental interaction
Behavioral and social cognitive	Continuity (no stages); experience at all points of development important	Environment viewed as the cause of behavior in both views
Ethological	Discontinuity but no stages; critical or sensitive periods emphasized; early experiences very important	Strong biological view
Ecological	Little attention to continuity/discontinuity; change emphasized more than stability	Strong environmental view

FIGURE **1.15**

A COMPARISON OF THEORIES AND ISSUES IN LIFE-SPAN DEVELOPMENT

ethological theories have highlighted biology's role and the importance of sensitive periods in development.

In short, although theories are helpful guides, relying on a single theory to explain development is probably a mistake. This book instead takes an **eclectic theoretical orientation,** which does not follow any one theoretical approach but rather selects from each theory whatever is considered its best features. In this way, you can view the study of development as it actually exists—with different theorists making different assumptions, stressing different empirical problems, and using different strategies to discover information. Figure 1.15 compares the main theoretical perspectives in terms of how they view important developmental issues in children's development.

eclectic theoretical orientation An orientation that does not follow any one theoretical approach, but rather selects from each theory whatever is considered the best in it.

Review *Connect* Reflect

LG3 Describe the main theories of human development.

Review

- What are the four steps of the scientific method? How can theory and hypotheses be defined? What are two main psychoanalytic theories? What are some contributions and criticisms of the psychoanalytic theories?
- What are three main cognitive theories? What are some contributions and criticisms of the cognitive theories?
- What are two main behavioral and social cognitive theories? What are some contributions and criticisms of the behavioral and social cognitive theories?
- What is the nature of ethological theory? What are some contributions and criticisms of the theory?
- What characterizes ecological theory? What are some contributions and criticisms of the theory?
- What is an eclectic theoretical orientation?

Connect

- The beginning of this section started with a question about whether special care might be able to repair the harm inflicted by child neglect. How might this question be answered differently using the different theories outlined?

Reflect *Your Own Personal Journey of Life*

- Which of the life-span theories do you think best explains your own development? Why?

4 Research in Life-Span Development

LG4 Explain how research on life-span development is conducted.

- Methods for Collecting Data
- Research Designs
- Time Span of Research
- Conducting Ethical Research
- Minimizing Bias

If they follow an eclectic orientation, how do scholars and researchers determine that one feature of a theory is somehow better than another? The scientific method discussed at the beginning of this chapter provides the guide. Through scientific research, the features of theories can be tested and refined.

Generally, research in life-span development is designed to test hypotheses, which in some cases are derived from the theories just described. Through research, theories are modified to reflect new data, and occasionally new theories arise. How are data about life-span development collected? What types of research designs are used to study life-span development? And what are some ethical considerations in conducting research on life-span development?

> Science refines everyday thinking.
>
> —Albert Einstein
>
> *German-born American Physicist, 20th Century*

METHODS FOR COLLECTING DATA

Whether we are interested in studying attachment in infants, the cognitive skills of children, or social relationships in older adults, we can choose from several ways of collecting data (Graziano & Raulin, 2010). Here we outline the measures most often used, beginning with observation.

Observation Scientific observation requires an important set of skills (McBurney & White, 2010). For observations to be effective, they have to be systematic. We have to have some idea of what we are looking for. We have to know whom we are observing, when and where we will observe, how the observations will be made, and how they will be recorded.

Where should we make our observations? We have two choices: the laboratory and the everyday world.

When we observe scientifically, we often need to control certain factors that determine behavior but are not the focus of our inquiry (McMillan & Wergin, 2010). For this reason, some research in life-span development is conducted in a **laboratory,** a controlled setting where many of the complex factors of the "real world" are absent. For example, suppose you want to observe how children react when

What are some important strategies in conducting observational research with children?

laboratory A controlled setting in which many of the complex factors of the "real world" are removed.

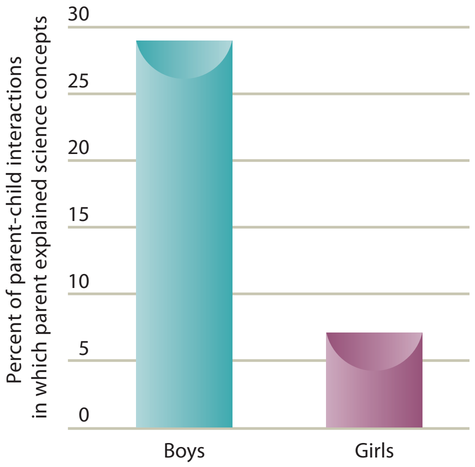


FIGURE **1.16**

PARENTS' EXPLANATIONS OF SCIENCE TO SONS AND DAUGHTERS AT A SCIENCE MUSEUM. In a naturalistic observation study at a children's science museum, parents were three times more likely to explain science to boys than to girls (Crowley & others, 2001). The gender difference occurred regardless of whether the father, the mother, or both parents were with the child, although the gender difference was greatest for fathers' science explanations to sons and daughters.

they see other people act aggressively. If you observe children in their homes or schools, you have no control over how much aggression the children observe, what kind of aggression they see, which people they see acting aggressively, or how other people treat the children. In contrast, if you observe the children in a laboratory, you can control these and other factors and therefore have more confidence about how to interpret your observations.

Laboratory research does have some drawbacks, however, including the following:

1. It is almost impossible to conduct research without the participants' knowing they are being studied.
2. The laboratory setting is unnatural and therefore can cause the participants to behave unnaturally.
3. People who are willing to come to a university laboratory may not fairly represent groups from diverse cultural backgrounds.
4. People who are unfamiliar with university settings, and with the idea of "helping science," may be intimidated by the laboratory setting.

Naturalistic observation provides insights that we sometimes cannot achieve in the laboratory (Plano Clark & Creswell, 2010). **Naturalistic observation** means observing behavior in real-world settings, making no effort to manipulate or control the situation. Life-span researchers conduct naturalistic observations at sporting events, child-care centers, work settings, malls, and other places people live in and frequent.

Naturalistic observation was used in one study that focused on conversations in a children's science museum (Crowley & others, 2001). When visiting exhibits at the science museum, parents were far more likely to engage boys than girls in explanatory talk. This finding suggests a gender bias that encourages boys more than girls to be interested in science (see Figure 1.16).

Survey and Interview Sometimes the best and quickest way to get information about people is to ask them for it. One technique is to interview them directly. A related method is the survey (sometimes referred to as a questionnaire), which is especially useful when information from many people is needed (Gay, Mills, & Airasian, 2009). A standard set of questions is used to obtain peoples' self-reported attitudes or beliefs about a particular topic. In a good survey, the questions are clear and unbiased, allowing respondents to answer unambiguously.

Surveys and interviews can be used to study a wide range of topics from religious beliefs to sexual habits to attitudes about gun control to beliefs about how to improve schools. Surveys and interviews may be conducted in person, over the telephone, and over the Internet.

One problem with surveys and interviews is the tendency of participants to answer questions in a way that they think is socially acceptable or desirable rather than to say what they truly think or feel (Creswell, 2008). For example, on a survey or in an interview some individuals might say that they do not take drugs even though they do.

Standardized Test A **standardized test** has uniform procedures for administration and scoring. Many standardized tests allow a person's performance to be compared with that of other individuals; thus they provide information about individual differences among people (Kingston, 2008). One example is the Stanford-Binet intelligence test, which is described in Chapter 9. Your score on the Stanford-Binet test tells you how your performance compares with that of thousands of other people who have taken the test (Bart & Peterson, 2008).

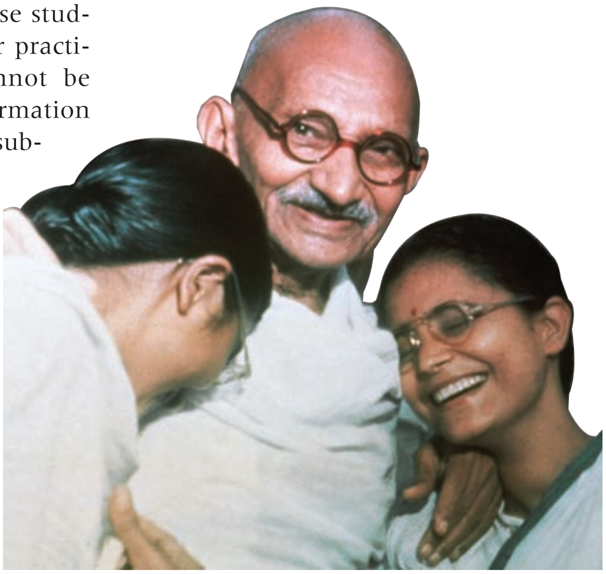
One criticism of standardized tests is that they assume a person's behavior is consistent and stable, yet personality and intelligence—two primary targets of standardized testing—can vary with the situation. For example, a person may perform poorly on a standardized intelligence test in an office setting but score much higher at home, where he or she is less anxious.

naturalistic observation Observing behavior in real-world settings.

standardized test A test with uniform procedures for administration and scoring. Many standardized tests allow a person's performance to be compared with the performance of other individuals.

Case Study A **case study** is an in-depth look at a single individual. Case studies are performed mainly by mental health professionals when, for either practical or ethical reasons, the unique aspects of an individual's life cannot be duplicated and tested in other individuals. A case study provides information about one person's experiences; it may focus on nearly any aspect of the subject's life that helps the researcher understand the person's mind, behavior, or other attributes. A researcher may gather information for a case study from interviews and medical records. In later chapters, we discuss vivid case studies, such as that of Michael Rehbein, who had much of the left side of his brain removed at 7 years of age to end severe epileptic seizures.

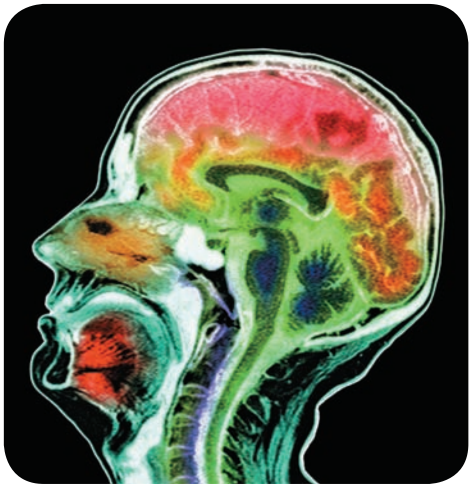
A case study can provide a dramatic, in-depth portrayal of an individual's life, but we must be cautious when generalizing from this information. The subject of a case study is unique, with a genetic makeup and personal history that no one else shares. In addition, case studies involve judgments of unknown reliability. Researchers who conduct case studies rarely check to see if other professionals agree with their observations or findings.



Mahatma Gandhi was the spiritual leader of India in the middle of the 20th century. Erik Erikson conducted an extensive case study of Gandhi's life to determine what contributed to his identity devlopment. *What are some limitations of the case study approach?*

Physiological Measures Researchers are increasingly using physiological measures when they study development at different points in the life span. For example, as puberty unfolds, the blood levels of certain hormones increase. To determine the nature of these hormonal changes, researchers analyze blood samples from adolescent volunteers (Susman & Dorn, 2009).

Another physiological measure that is increasingly being used is neuroimaging, especially functional magnetic resonance imaging (fMRI), in which electromagnetic waves are used to construct images of a person's brain tissue and biochemical activity (Nelson, 2011). We will have much more to say about neuroimaging and other physiological measures in later chapters.



This fMRI scan of a 51-year-old male shows atrophy in the cerebral cortex of the brain, which occurs in various disorders including stroke and Alzheimer's disease. The area of the upper cerebral cortex (where higher-level brain functioning such as thinking and planning occur) is colored dark red. Neuro-imaging techniques such as the fMRI are helping researchers to learn more about how the brain functions as people develop and age, as well as what happens to the brain when aging diseases such as stroke and Alzheimer's disease are present.

RESEARCH DESIGNS

In conducting research on life-span development, in addition to a method for collecting data, you also need a research design. There are three main types of research design: descriptive, correlational, and experimental.

Descriptive Research All of the data-collection methods that we have discussed can be used in **descriptive research,** which aims to observe and record behavior. For example, a researcher might observe the extent to which people are altruistic or aggressive toward each other. By itself, descriptive research cannot prove what causes some phenomena, but it can reveal important information about people's behavior (Leedy & Ormrod, 2010; Stake, 2010).

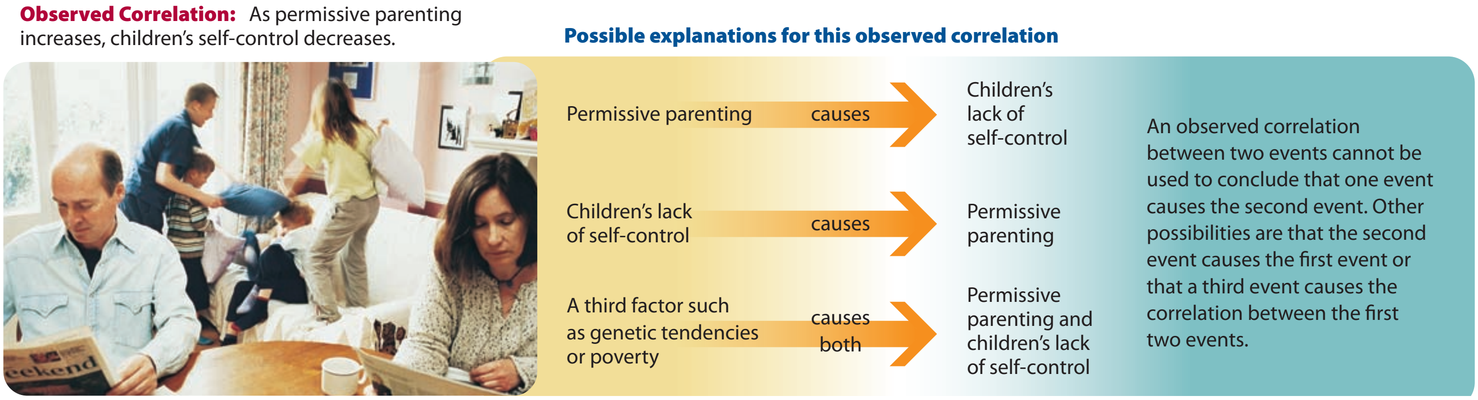
Correlational Research In contrast to descriptive research, correlational research goes beyond describing phenomena; it provides information that will help us to predict how people will behave. In **correlational research,** the goal is to describe the strength of the relationship between two or more events or characteristics. The more strongly the two events are correlated (or related or associated), the more effectively we can predict one event from the other (Kiess & Green, 2010).

For example, to study if children of permissive parents have less self-control than other children, you would need to carefully record observations of parents' permissiveness and their children's self-control. You might observe that the higher a parent was in permissiveness, the lower the child was in self-control. You would

case study An in-depth look at a single individual.

descriptive research Has the purpose of observing and recording behavior.

correlational research The goal is to describe the strength of the relationship between two or more events or characteristics.


Observed Correlation: As permissive parenting increases, children's self-control decreases.

Possible explanations for this observed correlation

Permissive parenting
causes
Children's lack of self-control
Children's lack of self-control
causes
Permissive parenting
A third factor such as genetic tendencies or poverty
causes both
Permissive parenting and children's lack of self-control

An observed correlation between two events cannot be used to conclude that one event causes the second event. Other possibilities are that the second event causes the first event or that a third event causes the correlation between the first two events.

FIGURE **1.17**
POSSIBLE EXPLANATIONS OF CORRELATIONAL DATA

then analyze these data statistically to yield a numerical measure, called a **correlation coefficient,** a number based on a statistical analysis that is used to describe the degree of association between two variables. The correlation coefficient ranges from +1.00 to −1.00. A negative number means an inverse relation. In this example, you might find an inverse correlation between permissive parenting and children's self-control with a coefficient of, say, −.30. By contrast, you might find a positive correlation of +.30 between parental monitoring of children and children's self-control.

The higher the correlation coefficient (whether positive or negative), the stronger the association between the two variables. A correlation of 0 means that there is no association between the variables. A correlation of −.40 is stronger than a correlation of +.20 because we disregard whether the correlation is positive or negative in determining the strength of the correlation.

A caution is in order, however. Correlation does not equal causation. The correlational finding just mentioned does not mean that permissive parenting necessarily causes low self-control in children. It could mean that, but it also could mean that a child's lack of self-control caused the parents to throw up their arms in despair and give up trying to control the child. It also could mean that other factors, such as heredity or poverty, caused the correlation between permissive parenting and low self-control in children. Figure 1.17 illustrates these possible interpretations of correlational data.

Experimental Research To study causality, researchers turn to experimental research. An **experiment** is a carefully regulated procedure in which one or more factors believed to influence the behavior being studied are manipulated while all other factors are held constant. If the behavior under study changes when a factor is manipulated, we say that the manipulated factor has caused the behavior to change. In other words, the experiment has demonstrated cause and effect. The cause is the factor that was manipulated. The effect is the behavior that changed because of the manipulation. Nonexperimental research methods (descriptive and correlational research) cannot establish cause and effect because they do not involve manipulating factors in a controlled way (Graziano & Raulin, 2010).

Independent and Dependent Variables Experiments include two types of changeable factors, or variables: independent and dependent. An independent variable is a manipulated, influential, experimental factor. It is a potential cause. The label "independent" is used because this variable can be manipulated independently of other factors to determine its effect. An experiment may include one independent variable or several of them.

A dependent variable is a factor that can change in an experiment, in response to changes in the independent variable. As researchers manipulate the independent variable, they measure the dependent variable for any resulting effect.

correlation coefficient A number based on statistical analysis that is used to describe the degree of association between two variables.

experiment A carefully regulated procedure in which one or more of the factors believed to influence the behavior being studied are manipulated while all other factors are held constant.

For example, suppose that you conducted a study to determine whether women could change the breathing and sleeping patterns of their newborn babies by meditating during pregnancy. You might require one group of pregnant women to engage in a certain amount and type of meditation each day while another group would not meditate; the meditation is thus the independent variable. When the infants are born, you would observe and measure their breathing and sleeping patterns. These patterns are the dependent variable, the factor that changes as the result of your manipulation.

Experimental and Control Groups Experiments can involve one or more experimental groups and one or more control groups. An experimental group is a group whose experience is manipulated. A control group is a comparison group that is as much like the experimental group as possible and that is treated in every way like the experimental group except for the manipulated factor (independent variable). The control group serves as a baseline against which the effects of the manipulated condition can be compared.

Random assignment is an important principle for deciding whether each participant will be placed in the experimental group or in the control group. Random assignment means that researchers assign participants to experimental and control groups by chance. It reduces the likelihood that the experiment's results will be due to any preexisting differences between groups (Mitchell & Jolley, 2010). In the example of the effects of meditation by pregnant women on the breathing and sleeping patterns of their newborns, you would randomly assign half of the pregnant women to engage in meditation over a period of weeks (the experimental group) and the other half to not meditate over the same number of weeks (the control group). Figure 1.18 illustrates the nature of experimental research.

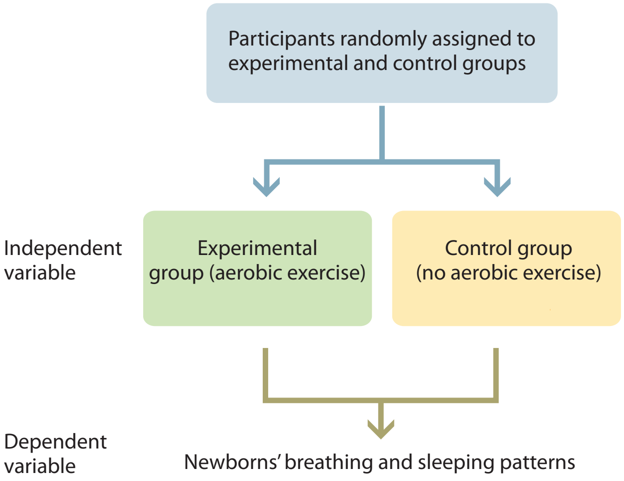

Participants randomly assigned to experimental and control groups
Independent variable
Experimental group (aerobic exercise)
Control group (no aerobic exercise)
Dependent variable
Newborns' breathing and sleeping patterns

FIGURE **1.18**

PRINCIPLES OF EXPERIMENTAL RESEARCH. Imagine that you decide to conduct an experimental study of the effects of aerobic exercise by pregnant women on their newborns' breathing and sleeping patterns. You would randomly assign pregnant women to experimental and control groups. The experimental-group women would engage in aerobic exercise over a specified number of sessions and weeks. The control group would not. Then, when the infants are born, you would assess their breathing and sleeping patterns. If the breathing and sleeping patterns of newborns whose mothers were in the experimental group are more positive than those of the control group, you would conclude that aerobic exercise caused the positive effects.

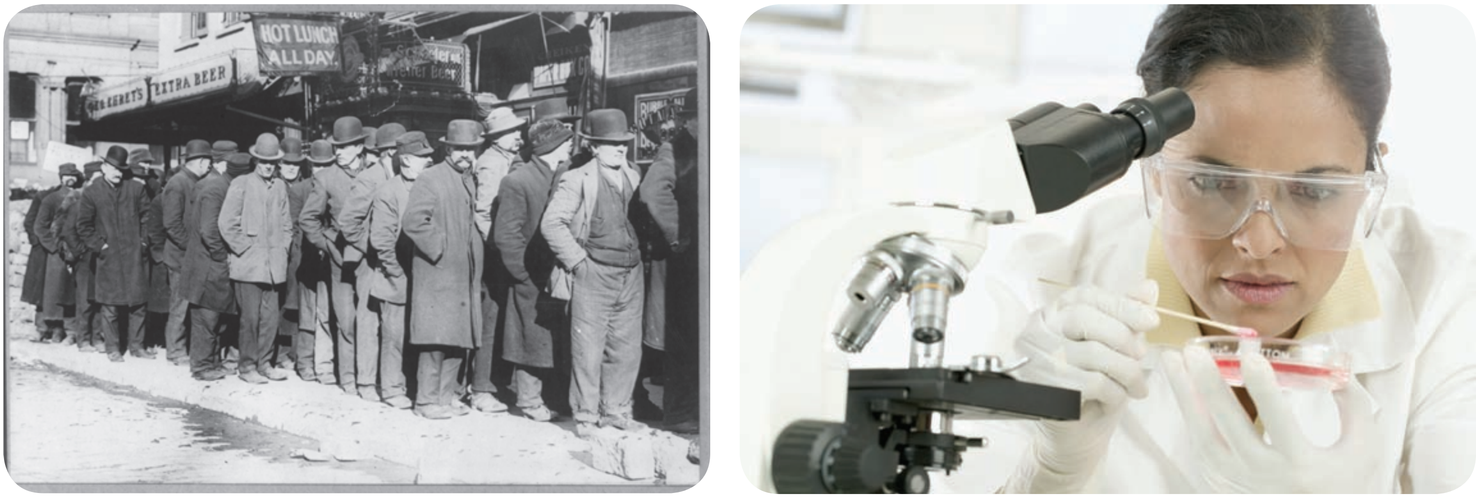
TIME SPAN OF RESEARCH

Researchers in life-span development have a special concern with studies that focus on the relation of age to some other variable. We have several options: Researchers can study different individuals of different ages and compare them or they can study the same individuals as they age over time.

Cross-Sectional Approach The **cross-sectional approach** is a research strategy that simultaneously compares individuals of different ages. A typical cross-sectional study might include three groups of children: 5-year-olds, 8-year-olds, and 11-year-olds. Another study might include a group of 15-year-olds, 25-year-olds, and 45-year-olds. The groups can be compared with respect to a variety of dependent variables: IQ, memory, peer relations, attachment to parents, hormonal changes, and so on. All of this can be accomplished in a short time. In some studies, data are collected in a single day. Even in large-scale cross-sectional studies with hundreds of subjects, data collection does not usually take longer than several months to complete.

The main advantage of the cross-sectional study is that the researcher does not have to wait for the individuals to grow up or become older. Despite its efficiency, though, the cross-sectional approach has its drawbacks. It gives no information about how individuals change or about the stability of their characteristics. It can obscure the increases and decreases of development—the hills and valleys of growth and development. For example, a cross-sectional study of life satisfaction might reveal average increases and decreases, but it would not show how the life satisfaction of individual adults waxed and waned over the years. It also would not tell us whether the same adults who had positive or negative perceptions of life satisfaction in early adulthood maintained their relative degree of life satisfaction as they became middle-aged or older adults.

cross-sectional approach A research strategy in which individuals of different ages are compared at one time.



Cohort effects are due to a person's time of birth or generation but not actually to age. Think for a moment about growing up in (a) the Great Depression and (b) today. *How might your development be different depending on which of these time frames has dominated your life? your parents' lives? your grandparents' lives?*

Longitudinal Approach The **longitudinal approach** is a research strategy in which the same individuals are studied over a period of time, usually several years or more. For example, in a longitudinal study of life satisfaction, the same adults might be assessed periodically over a 70-year time span—at the ages of 20, 35, 45, 65, and 90, for example.

Longitudinal studies provide a wealth of information about vital issues such as stability and change in development and the importance of early experience for later development, but they do have drawbacks (Gibbons, Hedeker, & DuToit, 2010). They are expensive and time consuming. The longer the study lasts, the more participants drop out—they move, get sick, lose interest, and so forth. The participants who remain may be dissimilar to those who drop out, biasing the outcome of the study. Those individuals who remain in a longitudinal study over a number of years may be more responsible and conformity-oriented, for example, or they might have more stable lives.

Cohort Effects A *cohort* is a group of people who are born at a similar point in history and share similar experiences as a result, such as living through the Vietnam War or growing up in the same city around the same time. These shared experiences may produce a range of differences among cohorts. For example, people who were teenagers during the Great Depression are likely to differ from people who were teenagers during the booming 1990s in their educational opportunities and economic status, in how they were raised, and in their attitudes toward sex and religion. In life-span development research, **cohort effects** are due to a person's time of birth, era, or generation but not to actual age.

Cohort effects are important because they can powerfully affect the dependent measures in a study ostensibly concerned with age (Schaie, 2010a, b). Researchers have shown it is especially important to be aware of cohort effects when assessing adult intelligence (Schaie, 2010a, b). Individuals born at different points in time—such as 1920, 1940, and 1960—have had varying opportunities for education. Individuals born in earlier years had less access to education, and this fact may have a significant effect on how this cohort performs on intelligence tests.

Cross-sectional studies can show how different cohorts respond, but they can confuse age changes and cohort effects. Longitudinal studies are effective in studying age changes but only within one cohort.

So far we have discussed many aspects of research in life-span development, but where can you read about this research firsthand? Read *Connecting Through Research* to find out.

developmental **connection**

Intelligence. Cohort effects help to explain differences in the intelligence of people born at different points in time. Chapter 15, p. 488

longitudinal approach A research strategy in which the same individuals are studied over a period of time, usually several years or more.

cohort effects Effects due to a person's time of birth, era, or generation but not to actual age.

connecting through research

Where Is Life-Span Research Published?

PEDIATRICS
JOURNAL OF RESEARCH ON ADOLESCENCE
the Journals of gerontology
series a BIOLOGICAL SCIENCES AND MEDICAL SCIENCES
Child Development
Developmental Psychology

Research journals are the core of information in virtually every academic discipline. Those shown here are among the increasing number of research journals that publish information about life-span development. *What are the main parts of a research article that present findings from original research?*

Regardless of whether you pursue a career in life-span development, psychology, or some related scientific field, you can benefit by learning about the journal process. As a student, you might be required to look up original research in journals. As a parent, teacher, or nurse you might want to consult journals to obtain information that will help you understand and work more effectively with people. And, as an inquiring person, you might look up information in journals after you have heard or read something that piqued your curiosity.

A journal publishes scholarly and academic information, usually in a specific domain—like physics, math, sociology, or, our current interest, life-span development. Scholars in these fields publish most of their research in journals, which are the source of core information in virtually every academic discipline.

An increasing number of journals publish information about life-span development. Among the leading journals in life-span development are *Developmental Psychology, Child Development, Pediatrics, Pediatric Nursing, The Journals of Gerontology, Infant Behavior and Development, Journal of Research on Adolescence, Journal of Adult Development, Journal of Gerontological Nursing, Psychology and Aging, Human Development*, and many others. Also, a number of journals that do not focus solely on development publish articles on various aspects of human development. These journals include *Journal of Educational Psychology, Sex Roles, Journal of Cross-Cultural Research, Journal of Marriage and the Family,* and *Journal of Consulting and Clinical Psychology.*

Every journal has a board of experts who evaluate articles submitted for publication. Each submitted paper is accepted or rejected on the basis of such factors as its contribution to the field, methodological excellence, and clarity of writing. Some of the most prestigious journals reject as many as 80 to 90 percent of the articles submitted.

Journal articles are usually written by professionals for other professionals in the specialized field of the journal's focus; therefore, they often contain technical language and terms specific to the discipline that are difficult for nonprofessionals to understand. Their organization often takes this course: abstract, introduction, method, results, discussion, and references.

The *abstract* is a brief summary that appears at the beginning of the article. The abstract lets readers quickly determine whether the article is relevant to their interests. The *introduction* introduces the problem or issue that is being studied. It includes a concise review of research relevant to the topic, theoretical ties, and one or more hypotheses to be tested. The *method* section consists of a clear description of the subjects evaluated in the study, the measures used, and the procedures that were followed. The method section should be sufficiently clear and detailed so that by reading it another researcher could repeat or replicate the study. The *results* section reports the analysis of the data collected. In most cases, the results section includes statistical analyses that are difficult for nonprofessionals to understand. The *discussion* section describes the author's conclusions, inferences, and interpretation of what was found. Statements are usually made about whether the hypotheses presented in the introduction were supported, limitations of the study, and suggestions for future research. The last part of the journal article, called *references,* includes bibliographic information for each source cited in the article. The references section is often a good source for finding other articles relevant to the topic that interests you.

Where do you find journals such as those described above? Your college or university library likely has some of them, and some public libraries also carry journals. Online resources such as PsycINFO and PubMed, which can facilitate the search for journal articles, are available to students on many campuses.

The research published in the journals mentioned above shapes our lives. It not only informs the research of other life-span development researchers, but it also informs the practices of law and policy makers, physicians, educators, parents, and many others. In fact, much of what you will find that is new in this edition of this textbook comes directly from the research that can be found in the journals mentioned above.

CONDUCTING ETHICAL RESEARCH

Ethics in research may affect you personally if you ever serve as a participant in a study. In that event, you need to know your rights as a participant and the responsibilities of researchers to assure that these rights are safeguarded.

If you ever become a researcher in life-span development yourself, you will need an even deeper understanding of ethics. Even if you only carry out experimental projects in psychology courses, you must consider the rights of the participants in those projects. A student might think, "I volunteer in a home for the mentally retarded several hours per week. I can use the residents of the home in my study to see if a particular treatment helps improve their memory for everyday tasks." But without proper permissions, the most well-meaning, kind, and considerate studies still violate the rights of the participants.

Today, proposed research at colleges and universities must pass the scrutiny of a research ethics committee before the research can be initiated. In addition, the American Psychological Association (APA) has developed ethics guidelines for its members. The code of ethics instructs psychologists to protect their participants from mental and physical harm. The participants' best interests need to be kept foremost in the researcher's mind (Fisher, 2009; Wiersman & Jurs, 2009). APA's guidelines address four important issues:

1. *Informed consent.* All participants must know what their research participation will involve and what risks might develop. Even after informed consent is given, participants must retain the right to withdraw from the study at any time and for any reason.
2. *Confidentiality*. Researchers are responsible for keeping all of the data they gather on individuals completely confidential and, when possible, completely anonymous.
3. *Debriefing*. After the study has been completed, participants should be informed of its purpose and the methods that were used. In most cases, the experimenter also can inform participants in a general manner beforehand about the purpose of the research without leading participants to behave in a way they think that the experimenter is expecting.
4. *Deception*. In some circumstances, telling the participants beforehand what the research study is about substantially alters the participants' behavior and invalidates the researcher's data. In all cases of deception, however, the psychologist must ensure that the deception will not harm the participants and that the participants will be debriefed (told the complete nature of the study) as soon as possible after the study is completed.

MINIMIZING BIAS

Studies of life-span development are most useful when they are conducted without bias or prejudice toward any particular group of people. Of special concern is bias based on gender and bias based on culture or ethnicity.

Gender Bias For most of its existence, our society has had a strong gender bias, a preconceived notion about the abilities of women and men that prevented individuals from pursuing their own interests and achieving their potential (Best, 2010; UNICEF, 2010). Gender bias also has had a less obvious effect within the field of life-span development. For example, it is not unusual for conclusions to be drawn about females' attitudes and behaviors from research conducted with males as the only participants (Hyde, 2007).

Furthermore, when researchers find gender differences, their reports sometimes magnify those differences (Denmark & others, 1988). For example, a researcher

connecting with careers

Pam Reid, Educational and Developmental Psychologist

Pam Reid (*Center*), with students at Saint Joseph College in Hartford, Connecticut, where she is the president of the college.

When she was a child, Pam Reid liked to play with chemistry sets. Reid majored in chemistry during college and wanted to become a doctor. However, when some of her friends signed up for a psychology class as an elective, she decided to take the course. She was intrigued by learning about how people think, behave, and develop—so much so that she changed her major to psychology. Reid went on to obtain her Ph.D. in psychology (American Psychological Association, 2003, p. 16).

For a number of years, Reid was a professor of education and psychology at the University of Michigan, where she also was a research scientist at the Institute for Research on Women and Gender. Her main focus has been on how children and adolescents develop social skills, with a special interest in the development of African American girls (Reid & Zalk, 2001). She has been active in community activities, including the creation of a math and technology enrichment program for middle school girls. In 2004, Reid became provost and executive vice-president at Roosevelt University in Chicago, and in 2008 became president of Saint Joseph College in Hartford, Connecticut.

For more information about what educational psychologists do, see page [46] in the Careers in Life-Span Development appendix.

might report that 74 percent of the men in a study had high achievement expectations versus only 67 percent of the women and go on to talk about the differences in some detail. In reality, this might be a rather small difference. It also might disappear if the study were repeated or the study might have methodological problems that don't allow such strong interpretations.

Pam Reid is a leading researcher who studies gender and ethnic bias in development. You can read about Pam's interests in *Connecting With Careers*.

Cultural and Ethnic Bias The realization that research on life-span development needs to include more people from diverse ethnic groups has also been building (Graham, 2006; Rowley, Kurtz-Costes, & Cooper, 2010). Historically, people from ethnic minority groups (African American, Latino, Asian American, and Native American) were excluded from most research in the United States and simply thought of as variations from the norm or average. If minority individuals were included in samples and their scores didn't fit the norm, they were viewed as confounds or "noise" in data and discounted. Given the fact that individuals from diverse ethnic groups were excluded from research on life-span development for so long, we might reasonably conclude that people's real lives are perhaps more varied than research data have indicated in the past.

Researchers also have tended to overgeneralize about ethnic groups (Banks, 2010; Swanson, Edwards, & Spencer, 2010). **Ethnic gloss** is using an ethnic label such as African American or Latino in a superficial way that portrays an ethnic

ethnic gloss Using an ethnic label such as African American or Latino in a superficial way that portrays an ethnic group as being more homogeneous than it really is.

Look at these two photographs, one of all non-Latino White males, the other of a diverse group of females and males from different ethnic groups, including some non-Latino White males. Consider a topic in life-span development, such as parenting love, or cultural values. *If you were conducting research on this topic, might the results of the study be different depending on whether the participants in your study were the individuals in the photograph on the left or the right?*

group as being more homogeneous than it really is (Trimble, 1988). For example, a researcher might describe a research sample like this: "The participants were 60 Latinos." A more complete description of the Latino group might be something like this: "The 60 Latino participants were Mexican Americans from low-income neighborhoods in the southwestern area of Los Angeles. Thirty-six were from homes in which Spanish is the dominant language spoken, 24 from homes in which English is the main language spoken. Thirty were born in the United States, 30 in Mexico. Twenty-eight described themselves as Mexican American, 14 as Mexican, 9 as American, 6 as Chicano, and 3 as Latino." Ethnic gloss can cause researchers to obtain samples of ethnic groups that are not representative of the group's diversity, which can lead to overgeneralization and stereotyping.

Ross Parke and Raymond Buriel (2006) recently described how research on ethnic minority children and their families has not been given adequate attention, especially in light of their significant rate of growth. Until recently, ethnic minority families were combined in the category "minority," which masks important differences among ethnic groups as well as diversity within an ethnic group. When research has been conducted on ethnic groups, most often they are compared to non–Latino Whites to identify group differences. An assumption in two-group studies is that ethnic minority children have not advanced far enough to be the same as non–Latino White children and that this developmental lag contributes to ethnic minority children's problems. Recently, some researchers have replaced two-group studies with more in-depth examination of variations within a single ethnic group. For example, a researcher might study how parents in an ethnic group adapt to the challenges they face as a minority in U.S. society and how these experiences contribute to the goals they have for their children.

The continued growth of minority families in the United States in approaching decades will mainly be due to the immigration of Latino and Asian families. Researchers need "to take into account their acculturation level and generational status of parents and children," and how they influence family processes and child outcomes (Parke & Buriel, 2006, p. 487). More attention also needs to be given to biculturalism because the complexity of diversity means that some children of color identify with two or more ethnic groups. And language development research needs to focus more on second-language acquisition (usually English) and bilingualism and how they are linked to school achievement (Levine & McCloskey, 2009).

Review *Connect* Reflect

LG4 Explain how research on life-span development is conducted.

Review

- What methods do researchers use to collect data on life-span development?
- What research designs are used to study human development?
- How is research conducted on the time span of people's lives?
- What are researchers' ethical responsibilities to the people they study?
- How can gender, cultural, and ethnic bias affect the outcome of a research study?

Connect

- Earlier in the chapter, you read about normative age-graded influences, normative history-graded influences, and normative life events. Describe how these influences relate to what you just read about cohort effects.

Reflect *Your Own Personal Journey of Life*

- You and your parents grew up at different points in time. Consider some ways that you are different from your parents. Do you think some of your differences might be due to cohort effects? Explain.

topical **connections**

In Chapter 2, we will continue to learn about theory and research as we explore the biological underpinnings of life-span development. The influence of human evolution on development will be covered, including a discussion of natural selection and adaptive behavior. We will examine how the human genome works, the collaborative nature of genes, and how our DNA plays a role in who we will become. We will explore the challenges and choices people encounter when deciding to reproduce, including infertility and adoption. And we will end by looking at the many sides of the age-old nature-nurture debate, discussing how heredity and environment interact.

looking ***forward***

reach your **learning goals**

1 The Life-Span Perspective

LG1 Discuss the distinctive features of a life-span perspective on development.

The Importance of Studying Life-Span Development

- Development is the pattern of change that begins at conception and continues through the human life span. It includes both growth and decline. Studying life-span development helps prepare us to take responsibility for children, gives us insight about our own lives, and gives us knowledge about what our lives will be like as we age.

Characteristics of the Life-Span Perspective

- The life-span perspective includes these basic conceptions: Development is lifelong, multidimensional, multidirectional, and plastic; its study is multidisciplinary; it is contextual; it involves growth, maintenance, and regulation of loss; and it is a co-construction of biological, cultural, and individual factors. Three important sources of contextual influences are (1) normative age-graded influences, (2) normative history-graded influences, and (3) nonnormative life events.

Some Contemporary Concerns

- Health and well-being, parenting, education, sociocultural contexts and diversity, and social policy are all areas of contemporary concern that are closely tied to life-span development. Important dimensions of the sociocultural context include culture, ethnicity, socioeconomic status, and gender. There is increasing interest in social policy issues related to children and to older adults.

2 The Nature of Development

LG2 Identify the most important processes, periods, and issues in development.

Biological, Cognitive, and Socioemotional Processes

- Three key developmental processes are biological, cognitive, and socioemotional. Throughout development, there are extensive connections between these processes.

Periods of Development

- The life span is commonly divided into these periods of development: prenatal, infancy, early childhood, middle and late childhood, adolescence, early adulthood, middle adulthood, and late adulthood. Recently, life-span developmentalists have described the human life span in terms of four ages with a special focus on the third and fourth ages, as well as a distinction between the young-old and oldest-old. An important aspect of life-span development involves connections across periods of development.

The Significance of Age

- According to some experts on life-span development, too much emphasis is placed on chronological age. In studies covering adolescence through old age, people report that they are not happier at one point in development than at others. We often think of age only in terms of chronological age, but a full evaluation of age requires consideration of chronological, biological, psychological, and social age. Neugarten emphasizes that we are moving toward a society in which chronological age is only a weak predictor of development in adulthood.

Developmental Issues

- The nature-nurture issue focuses on the extent to which development is mainly influenced by nature (biological inheritance) or nurture (experience). The stability-change issue focuses on the degree to which we become older renditions of our early experience or develop into someone different from who we were earlier in development. A special aspect of the stability-change issue is the extent to which development is determined by early versus later experiences. Developmentalists describe development as continuous (gradual, a cumulative change) or as discontinuous (abrupt, a sequence of stages). Most developmentalists recognize that extreme positions on the nature-nurture, stability-change, and continuity-discontinuity issues are unwise. Despite this consensus, there is still spirited debate on these issues.

3 Theories of Development

LG3 Describe the main theories of human development.

Psychoanalytic Theories

- The scientific method involves four main steps: (1) conceptualize a problem, (2) collect data, (3) analyze data, and (4) draw conclusions. Theory is often involved in conceptualizing a problem. A theory is an interrelated, coherent set of ideas that helps to explain phenomena and to make predictions. Hypotheses are specific assertions and predictions, often derived from theory, that can be tested. According to psychoanalytic theories, development primarily depends on the unconscious mind and is heavily couched in emotion. Freud also argued that individuals go through five psychosexual stages. Erikson's theory emphasizes eight psychosocial stages of development: trust versus mistrust, autonomy versus shame and doubt, initiative versus guilt, industry versus inferiority, identity versus identity confusion, intimacy versus isolation, generativity versus stagnation, and integrity versus despair. Contributions of psychoanalytic theories include an emphasis on a developmental framework, family relationships, and unconscious aspects of the mind. Criticisms include a lack of scientific support, too much emphasis on sexual underpinnings, and an image of people that is too negative.

Cognitive Theories

- Three main cognitive theories are Piaget's, Vygotsky's, and information processing. Cognitive theories emphasize thinking, reasoning, language, and other cognitive processes. Piaget proposed a cognitive developmental theory in which children use their cognition to adapt to their world. In Piaget's theory, children go through four cognitive stages: sensorimotor, preoperational, concrete operational, and formal operational. Vygotsky's sociocultural cognitive theory emphasizes how culture and social interaction guide cognitive development. The information-processing approach emphasizes that individuals manipulate information, monitor it, and strategize about it. Contributions of cognitive theories include an emphasis on the active construction of understanding and a positive view of development. Criticisms include giving too little attention to individual variations and skepticism about the pureness of Piaget's stages.

Behavioral and Social Cognitive Theories

- Two main behavioral and social cognitive theories are Skinner's operant conditioning and Bandura's social cognitive theory. In Skinner's operant conditioning, the consequences of a behavior produce changes in the probability of the behavior's occurrence. In Bandura's social cognitive theory, observational learning is a key aspect of life-span development. Bandura emphasizes reciprocal interactions among person/cognition, behavior, and environment. Contributions of the behavioral and social cognitive theories include an emphasis on scientific research and a focus on environmental factors. Criticisms include inadequate attention to developmental changes and, in Skinner's view, too little attention to cognition.

Ethological Theory

- Ethology stresses that behavior is strongly influenced by biology, is tied to evolution, and is characterized by critical or sensitive periods. Contributions of ethological theory include a focus on the biological and evolutionary basis of development. Criticisms include a belief that the concepts of critical and sensitive periods may be too rigid.

Ecological Theory

- Ecological theory emphasizes environmental contexts. Bronfenbrenner's environmental systems view of development proposes five environmental systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Contributions of the theory include a systematic examination of macro and micro dimensions of environmental systems and attention to connections between them. Criticisms include giving inadequate attention to biological factors, as well as a lack of emphasis on cognitive factors.

An Eclectic Theoretical Orientation

- An eclectic theoretical orientation does not follow any one theoretical approach but rather selects from each theory whatever is considered the best in it.

4 Research in Life-Span Development

LG4 Explain how research in life-span development is conducted.

Methods for Collecting Data

- Methods for collecting data about life-span development include observation (in a laboratory or a naturalistic setting), survey (questionnaire) or interview, standardized test, case study, and physiological measures.

Research Designs

- Three main research designs are descriptive, correlational, and experimental. Descriptive research aims to observe and record behavior. In correlational research, the goal is to describe the strength of the relationship between two or more events or characteristics. Experimental research involves conducting an experiment, which can determine cause and effect. An independent variable is the manipulated, influential, experimental factor. A dependent variable is a factor that can change in an experiment, in response to changes in the independent variable. Experiments can involve one or more experimental groups and control groups. In random assignment, researchers assign participants to experimental and control groups by chance.

Time Span of Research

- When researchers decide about the time span of their research, they can conduct cross-sectional or longitudinal studies. Life-span researchers are especially concerned about cohort effects.

Conducting Ethical Research

- Researchers' ethical responsibilities include seeking participants' informed consent, ensuring their confidentiality, debriefing them about the purpose and potential personal consequences of participating, and avoiding unnecessary deception of participants.

Minimizing Bias

- Researchers need to guard against gender, cultural, and ethnic bias in research. Every effort should be made to make research equitable for both females and males. Individuals from varied ethnic backgrounds need to be included as participants in life-span research, and overgeneralization about diverse members within a group must be avoided.

key **terms**

development 6
life-span perspective 6
normative age-graded influences 9
normative history-graded influences 9
nonnormative life events 9
culture 10
cross-cultural studies 10
ethnicity 10
socioeconomic status (SES) 10
gender 10
social policy 12
biological processes 15
cognitive processes 15
socioemotional processes 15
nature-nurture issue 20
stability-change issue 20
continuity-discontinuity issue 21
scientific method 22
theory 22
hypotheses 22
psychoanalytic theories 22
Erikson's theory 23
Piaget's theory 24
Vygotsky's theory 26
information-processing theory 26
social cognitive theory 27
ethology 27
Bronfenbrenner's ecological theory 28
eclectic theoretical orientation 31
laboratory 31
naturalistic observation 32
standardized test 32
case study 33
descriptive research 33
correlational research 33
correlation coefficient 34
experiment 34
cross-sectional approach 35
longitudinal approach 36
cohort effects 36
ethnic gloss 39

key **people**

Paul Baltes 7
Marian Wright Edelman 12
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Robert Siegler 26
B. F. Skinner 26
Albert Bandura 27
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John Bowlby 28
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Ross Parke and Raymond Buriel 40

appendix

Careers in Life-Span Development

The field of life-span development offers an amazing breadth of careers that can provide extremely satisfying work. College and university professors teach courses in many areas of life-span development. Teachers impart knowledge, understanding, and skills to children and adolescents. Counselors, clinical psychologists, nurses, and physicians help people of different ages to cope more effectively with their lives and improve their well-being.

These and many other careers related to life-span development offer many rewards. By working in the field of life-span development, you can help people to improve their lives, understand yourself and others better, possibly advance the state of knowledge in the field, and have an enjoyable time while you are doing these things. Many careers in life-span development pay reasonably well. For example, psychologists earn well above the median salary in the United States.

If you are considering a career in life-span development, would you prefer to work with infants? children? adolescents? older adults? As you go through this term, try to spend some time with people of different ages. Observe their behavior. Talk with them about their lives. Think about whether you would like to work with people of this age in your life's work.

In addition, to find out about careers in life-span development you might talk with people who work in various jobs. For example, if you have some interest in becoming a school counselor, call a school, ask to speak with a counselor, and set up an appointment to discuss the counselor's career and work. If you have an interest in becoming a nurse, call the nursing department at a hospital and set up an appointment to speak with the nursing coordinator about a nursing career.

Another way of exploring careers in life-span development is to work in a related job while you are in college. Many colleges and universities offer internships or other work experiences for students who major in specific fields. Course credit or pay is given for some of these jobs. Take advantage of these opportunities. They can help you decide if this is the right career for you, and they can help you get into graduate school, if you decide you want to go.

An advanced degree is not absolutely necessary for some careers in life-span development, but usually you can considerably expand your opportunities (and income) by obtaining a graduate degree. If you think you might want to go to graduate school, talk with one or more professors about your interests, keep a high grade-point average, take appropriate courses, and realize that you likely will need to take the Graduate Record Examination at some point.

In the upcoming sections, we will profile a number of careers in four areas: education/research; clinical/counseling; medical/nursing/physical development; and families/relationships. These are not the only career options in life-span development, but the profiles should give you an idea of the range of opportunities available. For each career, we will describe the work and address the amount of education required and the nature of the training. We have provided page numbers after some entries telling you where within the text you can find *Connecting With Careers*, the career profiles of people who hold some of these positions. The Web site for this book gives more detailed information about these careers in life-span development.

Education/Research

Numerous careers in life-span development involve education or research. The opportunities range from college professor to preschool teacher to school psychologist.

College/University Professor

Professors teach courses in life-span development at many types of institutions, including research universities with master's or Ph.D. programs in life-span development, four-year colleges with no graduate programs, and community colleges. The courses in life-span development are offered in many different programs and schools, including psychology, education, nursing, child and family studies, social work, and medicine. In addition to teaching at the undergraduate or graduate level (or both), professors may conduct research, advise students or direct their research, and serve on college or university committees. Research is part of a professor's job description at most universities with master's and Ph.D. programs, but some college professors do not conduct research and focus instead on teaching.

Teaching life-span development at a college or university almost always requires a Ph.D. or master's degree. Obtaining a Ph.D. usually takes four to six years of graduate work; a master's degree requires approximately two years. The training involves taking graduate courses, learning to conduct research, and attending and presenting papers at professional meetings. Many graduate students work as teaching or research assistants for professors in an apprenticeship relationship that helps them to become competent teachers and researchers. **Read the profiles of professors on p. 523 and p. 613.**

Researcher

Some individuals in the field of life-span development work in research positions. They might work for a university, a government agency such as the National Institute of Mental Health, or private industry. They generate research ideas, plan studies, carry out the research, and usually attempt to publish the research in a scientific journal. A researcher often works in collaboration with other researchers. One researcher might spend much of his or her time in a laboratory; another researcher might work out in the field, such as in schools, hospitals, and so on. Most researchers in life-span development have either a master's or a Ph.D.

Elementary or Secondary School Teacher

Elementary and secondary school teachers teach one or more subject areas, preparing the curriculum, giving tests, assigning grades, monitoring students' progress, conducting parent-teacher conferences, and attending workshops. Becoming an elementary or secondary school teacher requires a minimum of an undergraduate degree. The training involves taking a wide range of courses with a major or concentration in education as well as completing supervised practice teaching.

Exceptional Children (Special Education) Teacher

Teachers of exceptional children spend concentrated time with children who have a disability such as ADHD, mental retardation, or cerebral palsy, or with children who are gifted.

Usually some of their work occurs outside of the students' regular classroom and some of it inside the students' regular classroom. The exceptional children teacher works closely with the student's regular classroom teacher and parents to create the best educational program for the student. Teachers of exceptional children often continue their education after obtaining their undergraduate degree and attain a master's degree.

Early Education Educator

Early childhood educators work on college faculties and usually teach in community colleges that award an associate degree in early childhood education. They have a minimum of a master's degree in their field. In graduate school, they take courses in early child education and receive supervisory training in childcare or early childhood programs.

Preschool/Kindergarten Teacher

Preschool teachers teach mainly 4-year-old children, and kindergarten teachers primarily teach 5-year-old children. They usually have an undergraduate degree in education, specializing in early childhood education. State certification to become a preschool or kindergarten teacher usually is required.

Family and Consumer Science Educator

Family and consumer science educators may specialize in early childhood education or instruct middle and high school students about such matters as nutrition, interpersonal relationships, human sexuality, parenting, and human development. Hundreds of colleges and universities throughout the United States offer two- and four-year degree programs in family and consumer science. These programs usually require an internship. Additional education courses may be needed to obtain a teaching certificate. Some family and consumer educators go on to graduate school for further training, which provides a background for possible jobs in college teaching or research. **Read a profile of a family and consumer science educator on p. 362.**

Educational Psychologist

Educational psychologists most often teach in a college or university and conduct research in such areas of educational psychology as learning, motivation, classroom management, and assessment. They help train students for positions in educational psychology, school psychology, and teaching. Most educational psychologists have a doctorate in education, which takes four to six years of graduate work. **Read a profile of an educational psychologist on p. 39.**

School Psychologist

School psychologists focus on improving the psychological and intellectual well-being of elementary, middle/junior, and high school students. They give psychological tests, interview students and their parents, consult with teachers, and may provide counseling to students and their families. They may work in a centralized office in a school district or in one or more schools.

School psychologists usually have a master's or doctoral degree in school psychology. In graduate school, they take courses in counseling, assessment, learning, and other areas of education and psychology.

Gerontologist

Gerontologists usually work in research in some branch of the federal or state government. They specialize in the study of aging with a particular focus on government programs for older adults, social policy, and delivery of services to older adults. In their research, gerontologists define problems to be studied, collect data, interpret the results, and make recommendations for social policy. Most gerontologists have a master's or doctoral degree and have taken a concentration of coursework in adult development and aging.

Clinical/Counseling

There are a wide variety of clinical and counseling jobs that are linked with life-span development. These range from child clinical psychologist to adolescent drug counselor to geriatric psychiatrist.

Clinical Psychologist

Clinical psychologists seek to help people with psychological problems. They work in a variety of settings, including colleges and universities, clinics, medical schools, and private practice. Some clinical psychologists only conduct psychotherapy; others do psychological assessment and psychotherapy; some also do research. Clinical psychologists may specialize in a particular age group, such as children (child clinical psychologist) or older adults (often referred to as a geropsychologist).

Clinical psychologists have either a Ph.D. (which involves clinical and research training) or a Psy.D. degree (which only involves clinical training). This graduate training usually takes five to seven years and includes courses in clinical psychology and a one-year supervised internship in an accredited setting toward the end of the training. Many geropsychologists pursue a year or two of postdoctoral training. Most states require clinical psychologists to pass a test in order to become licensed in the state and to call themselves clinical psychologists. **Read a profile of a clinical psychologist on page 10.**

Psychiatrist

Psychiatrists obtain a medical degree and then do a residency in psychiatry. Medical school takes approximately four years and the psychiatry residency another three to four years. Unlike most psychologists (who do not go to medical school), psychiatrists can administer drugs to clients. (Recently, several states gave clinical psychologists the right to prescribe drugs.)

Like clinical psychologists, psychiatrists might specialize in working with children (child psychiatry) or with older adults (geriatric psychiatry). Psychiatrists might work in medical schools in teaching and research roles, in a medical clinic or hospital, or in private practice. In addition to administering drugs to help improve the lives of people with psychological problems, psychiatrists also may conduct psychotherapy. **Read a profile of a child psychiatrist on p. 341.**

Counseling Psychologist

Counseling psychologists work in the same settings as clinical psychologists and may do psychotherapy, teach, or conduct research. Many counseling psychologists do not do therapy with individuals who have severe mental disorders, such as schizophrenia.

Counseling psychologists go through much the same training as clinical psychologists, although in a graduate program in counseling rather than clinical psychology. Counseling psychologists have either a master's degree or a doctoral degree. They also must go through a licensing procedure. One type of master's degree in counseling leads to the designation of licensed professional counselor.

School Counselor

School counselors help students to cope with adjustment problems, identify their abilities and interests, develop academic plans, and explore career options. The focus of the job depends on the age of the children. High school counselors advise students about vocational and technical training and admissions requirements for college, as well as about taking entrance exams, applying for financial aid, and choosing a major. Elementary school counselors mainly counsel students about social and personal problems. They may observe children in the classroom and at play as part of their work. School counselors may work with students individually, in small groups, or even in a classroom. They often consult with parents, teachers, and school administrators when trying to help students. School counselors usually have a master's degree in counseling.

Career Counselor

Career counselors help individuals to identify their best career options and guide them in applying for jobs. They may work in private industry or at a college or university. They usually interview individuals and give them vocational and/or psychological tests to identify appropriate careers that fit their interests and abilities. Sometimes they help individuals to create résumés or conduct mock interviews to help them feel comfortable in a job interview. They might arrange and promote job fairs or other recruiting events to help individuals obtain jobs.

Rehabilitation Counselor

Rehabilitation counselors work with individuals to identify career options, develop adjustment and coping skills to maximize independence, and resolve problems created by a disability. A master's degree in rehabilitation counseling or guidance or counseling psychology is generally considered the minimum education requirement.

Social Worker

Many social workers are involved in helping people with social or economic problems. They may investigate, evaluate, and attempt to rectify reported cases of abuse, neglect, endangerment, or domestic disputes. They may intervene in families and provide counseling and referral services to individuals and families. Some social workers specialize in a certain area. For example, a medical social worker might coordinate support services to people with a long-term disability; family-care social workers often work with families with children or an older adult who needs support services. Social workers often work for publicly funded agencies at the city, state, or national level, although increasingly they work in the private sector in areas such as drug rehabilitation and family counseling.

Social workers have a minimum of an undergraduate degree from a school of social work that includes coursework in sociology and psychology. Some social workers also have a master's or doctoral degree. For example, medical social workers have a master's degree in social work (M.S.W.) and complete graduate coursework and supervised clinical experiences in medical settings.

Drug Counselor

Drug counselors provide counseling to individuals with drug-abuse problems. Some drug counselors specialize in working with adolescents or older adults. They may work on an individual basis with a substance abuser or conduct group therapy. They may work in private practice, with a state or federal government agency, with a company, or in a hospital.

At a minimum, drug counselors complete an associate's or certificate program. Many have an undergraduate degree in substance-abuse counseling, and some have master's and doctoral degrees. Most states provide a certification procedure for obtaining a license to practice drug counseling.

Medical/Nursing/Physical Development

This third main area of careers in life-span development includes a wide range of choices in the medical and nursing areas, as well as jobs pertaining to improving some aspect of a person's physical development.

Obstetrician/Gynecologist

An obstetrician/gynecologist prescribes prenatal and postnatal care, performs deliveries in maternity cases, and treats diseases and injuries of the female reproductive system. Becoming an obstetrician/gynecologist requires a medical degree plus three to five years of residency in obstetrics/gynecology. Obstetricians may work in private practice, a medical clinic, a hospital, or a medical school.

Pediatrician

A pediatrician monitors infants' and children's health, works to prevent disease or injury, helps children attain optimal health, and treats children with health problems. Pediatricians have earned a medical degree and completed a three- to five-year residency in pediatrics.

Pediatricians may work in private practice, a medical clinic, a hospital, or a medical school. Many pediatricians on the faculty of medical schools also teach and conduct research on children's health and diseases. **Read the profile of a pediatrician on p. 124.**

Geriatric Physician

Geriatric physicians diagnose medical problems of older adults, evaluate treatment options, and make recommendations for nursing care or other arrangements. They have a medical degree and specialized in geriatric medicine by doing a three- to five-year residency. Like other doctors, geriatric physicians may work in private practice, a medical clinic, a hospital, or a medical school. Those in medical school settings may not only treat older adults but also teach future physicians and conduct research.

Neonatal Nurse

Neonatal nurses deliver care to newborn infants. They may work with infants born under normal circumstances or premature and critically ill neonates. A minimum of an undergraduate degree in nursing with a specialization in the newborn is required. This training involves coursework in nursing and the biological sciences, as well as supervised clinical experiences.

Nurse-Midwife

A nurse-midwife formulates and provides comprehensive care to expectant mothers as they prepare to give birth, guides them through the birth process, and cares for them after the birth. The nurse-midwife also may provide care to the newborn, counsel parents on the infant's development and parenting, and provide guidance about health practices. Becoming a nurse-midwife generally requires an undergraduate degree from a school of nursing. A nurse-midwife most often works in a hospital setting. **Read the profile of a perinatal nurse on p. 96.**

Pediatric Nurse

Pediatric nurses monitor infants' and children's health, work to prevent disease or injury, and help children attain optimal health. They may work in hospitals, schools of nursing, or with pediatricians in private practice or at a medical clinic.

Pediatric nurses have a degree in nursing that takes two to five years to complete. They take courses in biological sciences, nursing care, and pediatrics, usually in a school of nursing. They also undergo supervised clinical experiences in medical settings. Some pediatric nurses go on to earn a master's or doctoral degree in pediatric nursing.

Geriatric Nurse

Geriatric nurses seek to prevent or intervene in the chronic or acute health problems of older adults. They may work in hospitals, nursing homes, schools of nursing, or with geriatric medical specialists or psychiatrists in a medical clinic or in private practice. Like pediatric nurses, geriatric nurses take courses in a school of nursing and obtain a degree in nursing, which takes from two to five years. They complete courses in biological sciences, nursing care, and mental health as well as supervised clinical training in geriatric settings. They also may obtain a master's or doctoral degree in their specialty. **Read a profile of a geriatric nurse on p. 555.**

Physical Therapist

Physical therapists work with individuals who have a physical problem due to disease or injury to help them function as competently as possible. They may consult with other professionals and coordinate services for the individual. Many physical therapists work with people of all ages, although some specialize in working with a specific age group, such as children or older adults.

Physical therapists usually have an undergraduate degree in physical therapy and are licensed by a state. They take courses and experience supervised training in physical therapy.

Occupational Therapist

Occupational therapists initiate the evaluation of clients with various impairments and manage their treatment. They help people regain, develop, and build skills that are important for independent functioning, health, well-being, security, and happiness. An "Occupational Therapist Registered" (OTR) must have a master's and/or doctoral degree with education ranging from two to six years. Training includes occupational therapy courses in a specialized program. National certification is required and licensing/registration is required in some states.

Therapeutic/Recreation Therapist

Therapeutic/recreation therapists maintain or improve the quality of life for people with special needs through intervention, leisure education, and recreation. They work in hospitals, rehabilitation centers, local government agencies, at-risk youth programs, as well as other settings. Becoming a therapeutic/recreation therapist requires an undergraduate degree with coursework in leisure studies and a concentration in therapeutic recreation. National certification is usually required. Coursework in anatomy, special education, and psychology is beneficial.

Audiologist

Audiologists assess and identify the presence and severity of hearing loss, as well as problems in balance. They may work in a medical clinic, with a physician in private practice, in a hospital, or in a medical school.

An audiologist completes coursework and supervised training to earn a minimum of an undergraduate degree in hearing science. Some audiologists also go on to obtain a master's or doctoral degree.

Speech Therapist

Speech therapists identify, assess, and treat speech and language problems. They may work with physicians, psychologists, social workers, and other health care professionals in a team approach to help individuals with physical or psychological problems that involve speech and language. Some speech therapists specialize in working with individuals of a particular age or people with a particular type of speech disorder. Speech therapists have a minimum of an undergraduate degree in speech and hearing science or in a type of communications disorder. They may work in private practice, hospitals and medical schools, and government agencies.

Genetic Counselor

Genetic counselors identify and counsel families at risk for genetic disorders. They work as members of a health care team, providing information and support to families who have members who have genetic defects or disorders or are at risk for a variety of inherited conditions. They also serve as educators and resource people for other health care professionals and the public. Almost one-half work in university medical centers; one-fourth work in private hospital settings.

Genetic counselors have specialized graduate degrees and experience in medical genetics and counseling. Most enter the field after majoring in undergraduate school in such disciplines as biology, genetics, psychology, nursing, public health, or social work. **Read a profile of a genetic counselor on p. 65.**

Families/Relationships

A number of careers and jobs related to life-span development focus on working with families and relationship problems. These range from home health aide to marriage and family therapist.

Home Health Aide

A home health aide provides services to older adults in the older adults' homes, helping them with basic self-care tasks. No higher education is required for this position. There is brief training by an agency.

Child Welfare Worker

Child protective services in each state employ child welfare workers. They protect children's rights, evaluate any maltreatment, and may have children removed from their homes if necessary. A child social worker has a minimum of an undergraduate degree in social work.

Child Life Specialist

Child life specialists work with children and their families when the child needs to be hospitalized. They monitor the child's activities, seek to reduce the child's stress, and help the child to cope and to enjoy the hospital experience as much as possible. Child life specialists may provide parent education and develop individualized treatment plans based on an assessment of the child's development, temperament, medical plan, and available social supports. Child life specialists have an undergraduate degree. They have taken courses in child development and education and usually completed additional courses in a child life program. **Read a profile of a child life specialist on p. 282.**

Marriage and Family Therapist

Marriage and family therapists work on the principle that many individuals who have psychological problems benefit when psychotherapy is provided in the context of a marital or family relationship. Marriage and family therapists may provide marital therapy, couple therapy to individuals in a relationship who are not married, and family therapy to two or more members of a family.

Marriage and family therapists have a master's or a doctoral degree. They complete a training program in graduate school similar to a clinical psychologist's but with the focus on marital and family relationships. In most states, it is necessary to go through a licensing procedure to practice marital and family therapy. **Read the profile of a marriage and family therapist on p. 257.**

Further Careers

These are only a handful of careers that knowledge of developmental psychology can prepare you for. *Connecting With Careers* highlight additional careers, including an infant assessment specialist (p. 162), child care director (p. 200), toy designer (p. 227), health psychologist (p. 404), college/career counselor (p. 418), parent counselor (p. 464), pastoral counselor (p. 496), association director (p. 584), and home hospice nurse (p. 627). *What other careers can you think of that require a knowledge of human development?*

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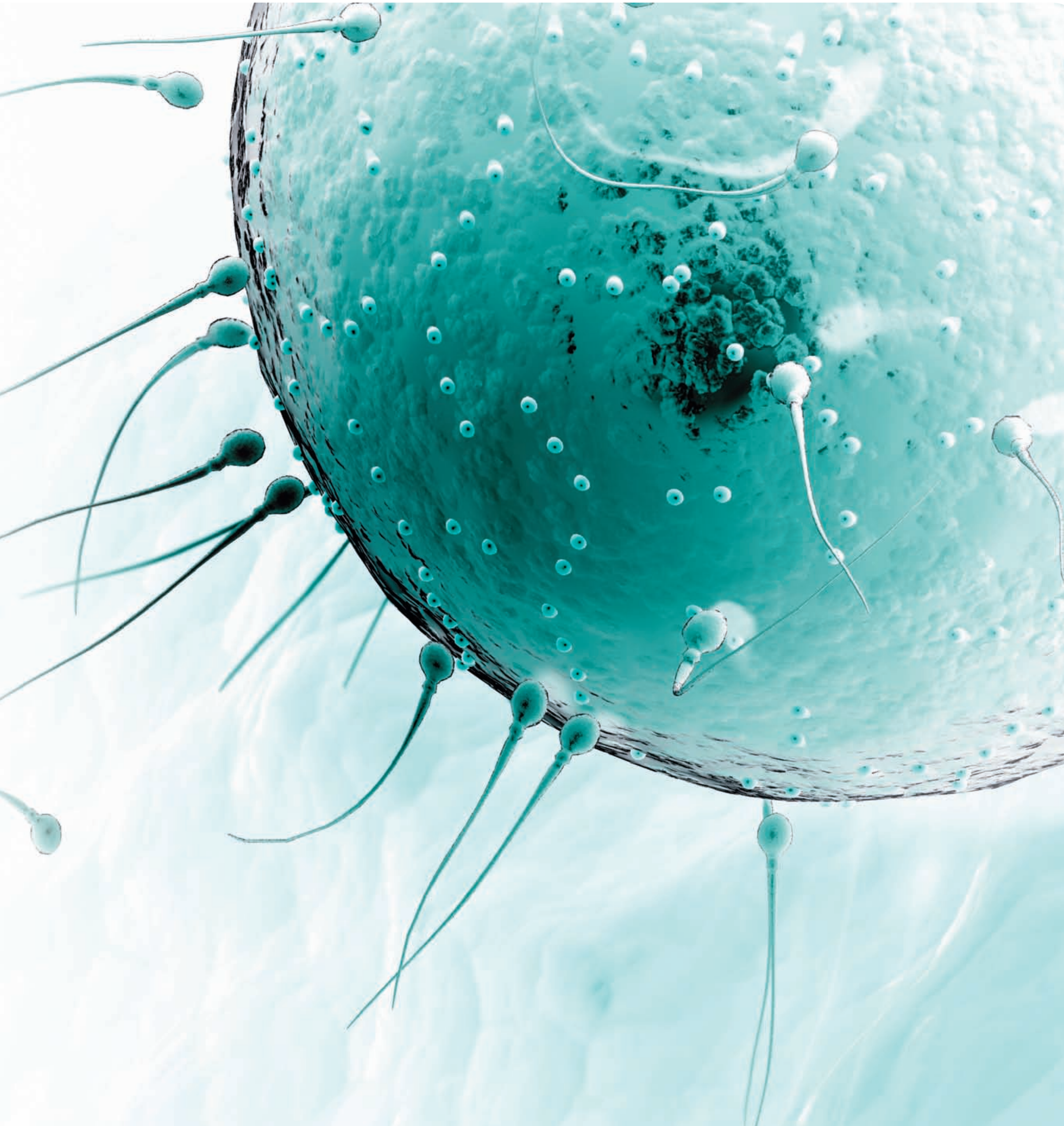
section **two**

There are one hundred and ninety-three living species of monkeys and apes. One hundred and ninety-two of them are covered with hair. The exception is the naked ape, self-named Homo sapiens.

—Desmond Morris
British Zoologist, 20th Century

Beginnings

The rhythm and meaning of life involve beginnings. Questions are raised about how, from so simple a beginning, endless forms develop, grow, and mature. What was this organism, what is the organism, and what will this organism be? In Section 2, you will read two chapters: "Biological Beginnings" (Chapter 2) and "Prenatal Development Birth" (Chapter 3).



chapter 2 BIOLOGICAL BEGINNINGS

chapter **outline**

1 The Evolutionary Perspective

Learning Goal 1 Discuss the evolutionary perspective on life-span development.

Natural Selection and Adaptive Behavior
Evolutionary Psychology

2 Genetic Foundations of Development

Learning Goal 2 Describe what genes are and how they influence human development.

The Collaborative Gene
Genes and Chromosomes
Genetic Principles
Chromosomal and Gene-Linked Abnormalities

3 Reproductive Challenges and Choices

Learning Goal 3 Identify some important reproductive challenges and choices.

Prenatal Diagnostic Tests
Infertility and Reproductive Technology
Adoption

4 Heredity and Environment Interaction: The Nature-Nurture Debate

Learning Goal 4 Explain some of the ways that heredity and environment interact to produce individual differences in development.

Behavior Genetics
Heredity-Environment Correlations
Shared and Nonshared Environmental Experiences
The Epigenetic View and Gene × Environment (G × E) Interaction
Conclusions About Heredity-Environment Interaction

Jim Springer and Jim Lewis are identical twins. They were separated at 4 weeks of age and did not see each other again until they were 39 years old. Both worked as part-time deputy sheriffs, vacationed in Florida, drove Chevrolets, had dogs named Toy, and married and divorced women named Betty. One twin named his son James Allan, and the other named his son James Alan. Both liked math but not spelling, enjoyed carpentry and mechanical drawing, chewed their fingernails down to the nubs, had almost identical drinking and smoking habits, had hemorrhoids, put on 10 pounds at about the same point in development, first suffered headaches at the age of 18, and had similar sleep patterns.

Jim and Jim do have some differences. One wears his hair over his forehead, the other slicks it back and has sideburns. One expresses himself best orally; the other is more proficient in writing. But, for the most part, their profiles are remarkably similar.

Another pair of identical twins, Daphne and Barbara, are called the "giggle sisters" because after being reunited they were always making each other laugh. A thorough search of their adoptive families' histories revealed no gigglers. The giggle sisters ignored stress, avoided conflict and controversy whenever possible, and showed no interest in politics.

Jim and Jim and the giggle sisters were part of the Minnesota Study of Twins Reared Apart, directed by Thomas Bouchard and his colleagues. The study brings identical twins (identical genetically because they come from the same fertilized egg) and fraternal twins (who come from different fertilized eggs) from all over the world to Minneapolis to investigate their lives. There the twins complete personality and intelligence tests, and they provide detailed medical histories, including information about diet and smoking, exercise habits, chest X-rays, heart stress tests, and EEGs. The twins are asked more than 15,000 questions about their

Jim Lewis (*left*) and Jim Springer (*right*).

topical **connections**

The previous chapter introduced the field of life-span development, including discussion of three key developmental processes: biological, cognitive, and socioemotional. In this chapter, we lay the foundation of the biological aspects of development. Biological processes, guided by genes, influence an individual's development in every period of the human life span. The forthcoming discussion of genetics and the previous discussion of theories (psychoanalytic, cognitive, behavioral and social cognitive, ethological, and ecological) in Chapter 1 provide a knowledge base to examine one of life-span development's major issues and debates—how strongly development is influenced by heredity (nature) and the environment (nurture).

looking ***back***

family and childhood, personal interests, vocational orientation, values, and aesthetic judgments (Bouchard & others, 1990).

When genetically identical twins who were separated as infants show such striking similarities in their tastes and habits and choices, can we conclude that their genes must have caused the development of those tastes and habits and choices? Other possible causes need to be considered. The twins shared not only the same genes but also some experiences. Some of the separated twins lived together for several months prior to their adoption; some of the twins had been reunited prior to testing (in some cases, many years earlier); adoption agencies often place twins in similar homes; and even strangers who spend several hours together and start comparing their lives are likely to come up with some coincidental similarities (Joseph, 2006). The Minnesota study of identical twins points to both the importance of the genetic basis of human development and the need for further research on genetic and environmental factors (Lykken, 2001). We will discuss twins studies in more detail in the section on behavior genetics later in this chapter.

> What endless questions vex the thought, of whence and whither, when and how.
>
> —Sir Richard Burton
> *British Explorer, 19th Century*

preview

The examples of Jim and Jim and the giggle sisters stimulate us to think about our genetic heritage and the biological foundations of our existence. However, organisms are not like billiard balls, moved by simple external forces to predictable positions on life's table. Environmental experiences and biological foundations work together to make us who we are. Our coverage of life's biological beginnings focuses on evolution, genetic foundations, challenges and choices regarding reproduction, and the interaction of heredity and environment.

1 The Evolutionary Perspective

LG1 Discuss the evolutionary perspective on life-span development.

- Natural Selection and Adaptive Behavior
- Evolutionary Psychology

In evolutionary time, humans are relative newcomers to Earth. As our earliest ancestors left the forest to feed on the savannahs, and then to form hunting societies on the open plains, their minds and behaviors changed, and they eventually established humans as the dominant species on Earth. How did this evolution come about?

How does the attachment of this Vietnamese baby to its mother reflect the evolutionary process of adaptive behavior?

NATURAL SELECTION AND ADAPTIVE BEHAVIOR

Natural selection is the evolutionary process by which those individuals of a species that are best adapted are the ones that survive and reproduce. To understand what this means, let's return to the middle of the nineteenth century, when the British naturalist Charles Darwin was traveling around the world, observing many different species of animals in their natural surroundings. Darwin, who published his observations and thoughts in *On the Origin of Species* (1859), noted that most organisms reproduce at rates that would cause enormous increases in the population of most species and yet populations remain nearly constant. He reasoned that an intense, constant struggle for food, water, and resources must occur among the many young born each generation, because many of the young do not survive. Those that do survive and reproduce pass on their characteristics to the next generation. Darwin argued that these survivors are better *adapted* to their world than are the nonsurvivors (Brooker, 2011). The best-adapted individuals survive to leave the most offspring. Over the course of many generations, organisms with the characteristics needed for survival make up an increased percentage of the population. Over many, many generations, this could produce a gradual modification of the whole population. If environmental conditions change, however, other characteristics might become favored by natural selection, moving the species in a different direction (Mader, 2011).

All organisms must adapt to particular places, climates, food sources, and ways of life (Audesirk, Audesirk, & Byers, 2011). An eagle's claws are a physical adaptation that facilitates predation. *Adaptive behavior* is behavior that promotes an organism's survival in the natural habitat (Johnson & Losos, 2010). For example, attachment between a caregiver and a baby ensures the infant's closeness to a caregiver for feeding and protection from danger, thus increasing the infant's chances of survival.

EVOLUTIONARY PSYCHOLOGY

Although Darwin introduced the theory of evolution by natural selection in 1859, his ideas only recently have become a popular framework for explaining behavior. Psychology's newest approach, **evolutionary psychology,** emphasizes the importance of adaptation, reproduction, and "survival of the fittest" in shaping behavior. "Fit" in this sense refers to the ability to bear offspring that survive long enough to bear offspring of their own. In this view, natural selection favors behaviors that increase reproductive success, the ability to pass your genes to the next generation (Confer & others, 2010; Cosmides, 2011).

David Buss (1995, 2004, 2008) has been especially influential in stimulating new interest in how evolution can explain human behavior. He reasons that just as evolution shapes our physical features, such as body shape and height, it also pervasively influences how we make decisions, how aggressive we are, our fears, and our mating patterns. For example, assume that our ancestors were hunters and gatherers on the plains and that men did most of the hunting and women stayed close to home gathering seeds and plants for food. If you have to travel some distance from your home in an effort to find and slay a fleeing animal, you need not only certain physical traits but also the ability for certain types of spatial thinking. Men born with these traits would be more likely than men without them to survive, to bring home lots of food, and to be considered attractive mates—and thus to reproduce and pass on these characteristics to their children. In other words, these traits would provide a reproductive advantage for males—over many generations, men with good spatial thinking skills might become more numerous in the population. Critics point out that this scenario might or might not have actually happened.

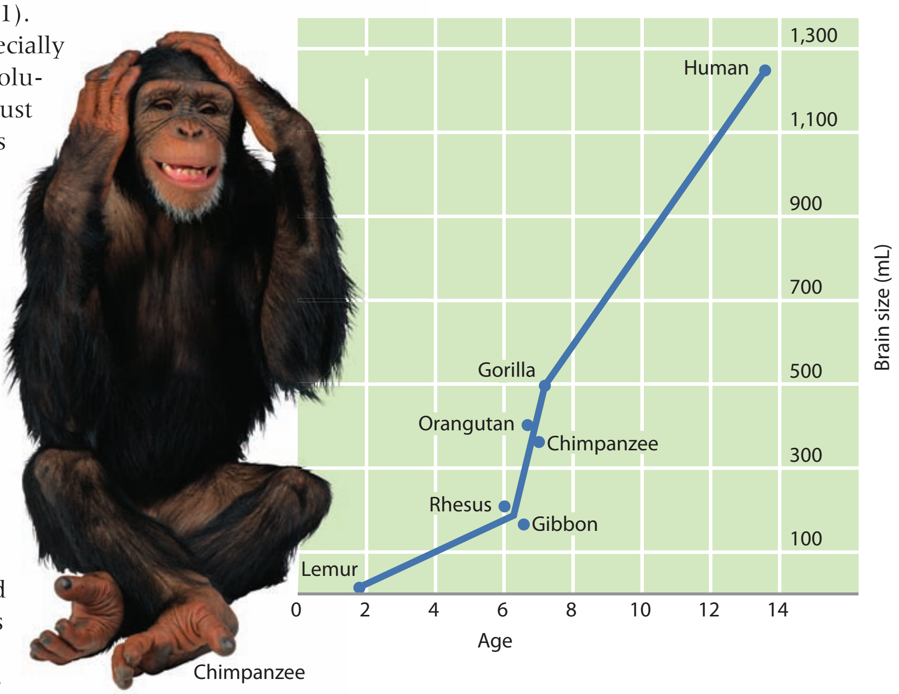


FIGURE **2.1**

THE BRAIN SIZES OF VARIOUS PRIMATES AND HUMANS IN RELATION TO THE LENGTH OF THE CHILDHOOD PERIOD. Compared with other primates, humans have both a larger brain and a longer childhood period. *What conclusions can you draw from the relationship indicated by this graph?*

Evolutionary Developmental Psychology Recently, interest has grown in using the concepts of evolutionary psychology to understand human development (Bjorklund, 2006, 2007). Here we discuss some ideas proposed by evolutionary developmental psychologists (Bjorklund & Pellegrini, 2002).

An extended childhood period evolved because humans require time to develop a large brain and learn the complexity of human societies. Humans take longer to become reproductively mature than any other mammal (see Figure 2.1). During this

evolutionary psychology Emphasizes the importance of adaptation, reproduction, and "survival of the fittest" in shaping behavior.

extended childhood period, they develop a large brain and the experiences needed to become competent adults in a complex society.

Many evolved psychological mechanisms are domain-specific. That is, the mechanisms apply only to a specific aspect of a person's makeup. According to evolutionary psychology, information processing is one example. In this view, the mind is not a general-purpose device that can be applied equally to a vast array of problems. Instead, as our ancestors dealt with certain recurring problems, such as hunting and finding shelter, specialized modules evolved that process information related to those problems. For example, a module for physical knowledge for tracking animals, a module for mathematical knowledge for trading, and a module for language.

Evolved mechanisms are not always adaptive in contemporary society. Some behaviors that were adaptive for our prehistoric ancestors may not serve us well today. For example, the food-scarce environment of our ancestors likely led to humans' propensity to gorge when food is available and to crave high-caloric foods, a trait that might lead to an epidemic of obesity when food is plentiful.

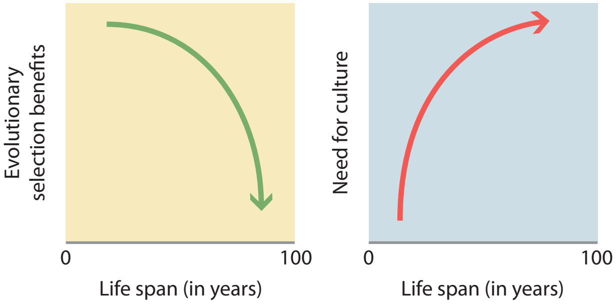


FIGURE **2.2**

BALTES' VIEW OF EVOLUTION AND CULTURE ACROSS THE LIFE SPAN. Benefits derived from evolutionary selection decrease as we age, whereas the need for culture increases with age.

developmental **connection**

Life-Span Perspective. Baltes described eight main characteristics of the life-span perspective. Chapter 1, p. 7

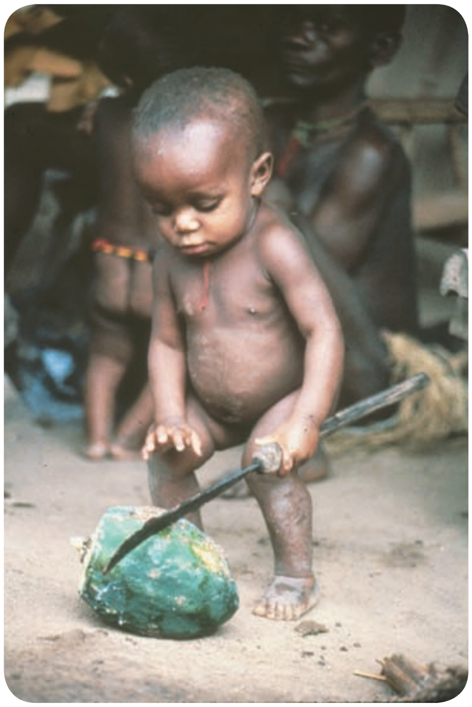
Connecting Evolution and Life-Span Development In evolutionary theory, what matters is that individuals live long enough to reproduce and pass on their characteristics (Raven, 2011). So why do humans live so long after reproduction? Perhaps evolution favored longevity because having older people around improves the survival rates of babies. Possibly having grandparents alive to care for the young while parents were out hunting and gathering food created an evolutionary advantage.

According to life-span developmentalist Paul Baltes (2003), the benefits conferred by evolutionary selection decrease with age. Natural selection has not weeded out many harmful conditions and nonadaptive characteristics that appear among older adults. Why? Natural selection operates primarily on characteristics that are tied to reproductive fitness, which extends through the earlier part of adulthood. Thus, says Baltes, selection primarily operates during the first half of life.

As an example, consider Alzheimer disease, an irreversible brain disorder characterized by gradual deterioration. This disease typically does not appear until age 70 or later. If it were a disease that struck 20-year-olds, perhaps natural selection would have eliminated it eons ago.

Thus, unaided by evolutionary pressures against nonadaptive conditions, we suffer the aches, pains, and infirmities of aging. And as the benefits of evolutionary selection decrease with age, argues Baltes, the need for culture increases (see Figure 2.2). That is, as older adults weaken biologically, they need culture-based resources such as cognitive skills, literacy, medical technology, and social support. For example, older adults may need help and training from other people to maintain their cognitive skills (Knight & Sayegh, 2010).

Evaluating Evolutionary Psychology Although the popular press gives a lot of attention to the ideas of evolutionary psychology, it remains just one theoretical approach. Like the theories described in Chapter 1, it has limitations, weaknesses, and critics (Confer & others, 2010). Albert Bandura (1998), whose social cognitive theory was described in Chapter 1, acknowledges the important influence of evolution on human adaptation. However, he rejects what he calls "one-sided evolutionism," which sees social behavior as the product of evolved biology. An alternative is a bidirectional view, in which environmental and biological conditions influence each other. In this view, evolutionary pressures created changes in biological structures that allowed the use of tools, which enabled our ancestors to manipulate the environment, constructing new environmental conditions. In turn, environmental innovations produced new selection pressures that led to the evolution of specialized biological systems for consciousness, thought, and language.



Children in all cultures are interested in the tools that adults in their cultures use. For example, this 11-month-old boy from the Efe culture in the Democratic Republic of the Congo in Africa is trying to cut a papaya with an *apopau* (a smaller version of a machete). *Might the infant's behavior be evolutionary-based or be due to both biological and environmental conditions?*

In other words, evolution gave us bodily structures and biological potentialities; it does not dictate behavior. People have used their biological capacities to produce diverse cultures—aggressive and pacific, egalitarian and autocratic. As American scientist Steven Jay Gould (1981) concluded, in most domains of human functioning, biology allows a broad range of cultural possibilities.

The "big picture" idea of natural selection leading to the development of human traits and behaviors is difficult to refute or test because it is on a time scale that does not lend itself to empirical study. Thus, studying specific genes in humans and other species—and their links to traits and behaviors—may be the best approach for testing ideas coming out of evolutionary psychology.

Review *Connect* Reflect

LG1 Discuss the evolutionary perspective on life span development.

Review

- How can natural selection and adaptive behavior be defined?
- What is evolutionary psychology? What are some basic ideas about human development proposed by evolutionary psychologists? How might evolutionary influences have different effects at different points in the life span? How can evolutionary psychology be evaluated?

Connect

- In the section on ethological theory in the previous chapter, you learned about critical time periods. How does the concept of critical period relate to what you learned about older adults and aging in this section?

Reflect *Your Own Personal Journey of Life*

- Which do you think is more persuasive in explaining your development: the views of evolutionary psychologists or their critics? Why?

2 Genetic Foundations of Development

LG2 Describe what genes are and how they influence human development.

- The Collaborative Gene
- Genes and Chromosomes
- Genetic Principles
- Chromosomal and Gene-Linked Abnormalities

Genetic influences on behavior evolved over time and across many species. The many traits and characteristics that are genetically influenced have a long evolutionary history that is retained in our DNA. Our DNA is not just inherited from our parents; it's what we've inherited as a species from species that came before us.

How are characteristics that suit a species for survival transmitted from one generation to the next? Darwin did not know because genes and the principles of genetics had not yet been discovered. Each of us carries a "genetic code" that we inherited from our parents. Because a fertilized egg carries this human code, a fertilized human egg cannot grow into an egret, eagle, or elephant.

developmental **connection**

Biological Processes. A current biological theory of aging emphasizes that changes in the tips of chromosomes play a key role in aging. Chapter 17, p. 537

THE COLLABORATIVE GENE

Each of us began life as a single cell weighing about one twenty-millionth of an ounce! This tiny piece of matter housed our entire genetic code—instructions that

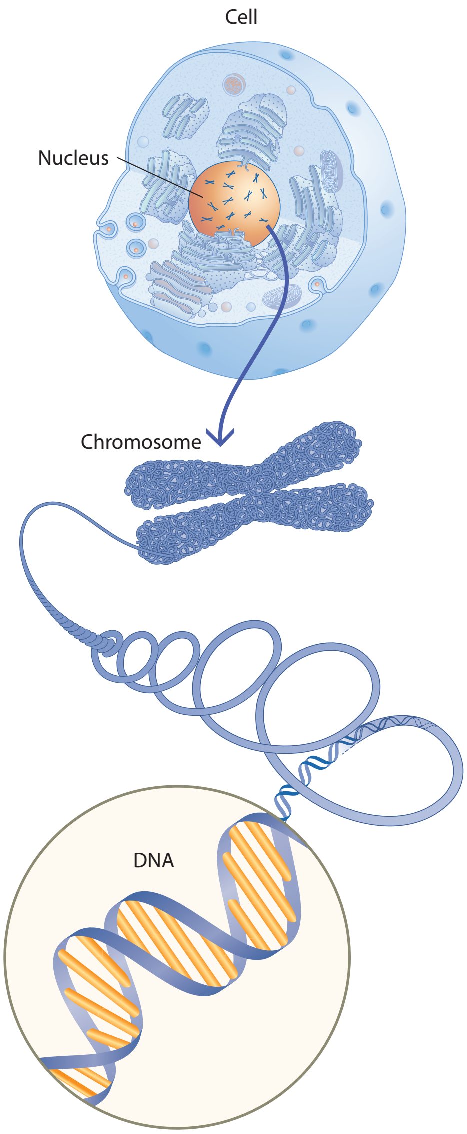


FIGURE **2.3**

CELLS, CHROMOSOMES, DNA, AND GENES. (*Top*) The body contains trillions of cells. Each cell contains a central structure, the nucleus. (*Middle*) Chromosomes are threadlike structures located in the nucleus of the cell. Chromosomes are composed of DNA. (*Bottom*) DNA has the structure of a spiral staircase. A gene is a segment of DNA.

orchestrated growth from that single cell to a person made of trillions of cells, each containing a replica of the original code. That code is carried by our genes. What are genes and what do they do? For the answer, we need to look into our cells.

The nucleus of each human cell contains **chromosomes,** which are threadlike structures made up of deoxyribonucleic acid, or DNA. **DNA** is a complex molecule with a double helix shape, like a spiral staircase (shown in Figure 2.3), and contains genetic information. **Genes,** the units of hereditary information, are short segments of DNA. They direct cells to reproduce themselves and to assemble proteins. Proteins, in turn, are the building blocks of cells as well as the regulators that direct the body's processes (Freeman, 2011).

Each gene has its own location, its own designated place on a particular chromosome. Today, there is a great deal of enthusiasm about efforts to discover the specific locations of genes that are linked to certain functions (Lewis, 2010). An important step in this direction is the Human Genome Project's efforts to map the human genome—the complete set of developmental instructions for creating proteins that initiate the making of a human organism (Willey, Sherwood, & Woolverton, 2011).

One of the big surprises of the Human Genome Project was an early report indicating that humans have only about 30,000 genes (U.S. Department of Energy, 2001). More recently, the number of human genes has been revised further downward to approximately 20,500 (Ensembl Human, 2010; Science Daily, 2008). Scientists had thought that humans had as many as 100,000 or more genes. They had also maintained that each gene programmed just one protein. In fact, humans have far more proteins than they have genes, so there cannot be a one-to-one correspondence between genes and proteins (Commoner, 2002). Each gene is not translated, in automaton-like fashion, into one and only one protein. A gene does not act independently, as developmental psychologist David Moore (2001) emphasized by titling his book *The Dependent Gene*.

Rather than being a group of independent genes, the human genome consists of many genes that collaborate both with each other and with nongenetic factors inside and outside the body. The collaboration operates at many points. For example, the cellular machinery mixes, matches, and links small pieces of DNA to reproduce the genes—and that machinery is influenced by what is going on around it.

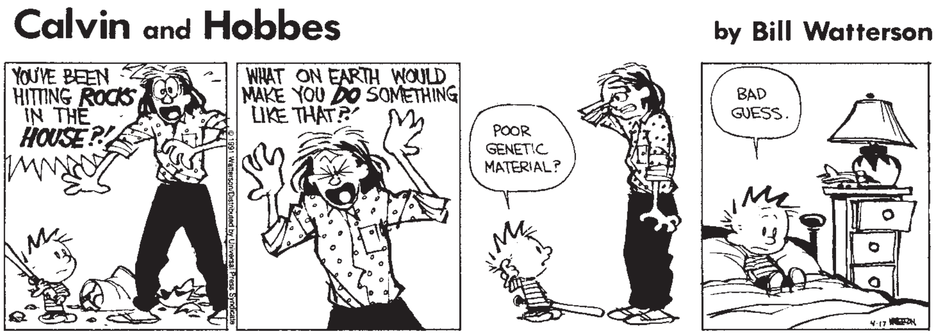
Whether a gene is turned "on," working to assemble proteins, is also a matter of collaboration. The activity of genes (genetic expression) is affected by their environment (Gottlieb, 2007; Meaney, 2010). For example, hormones that circulate in the blood make their way into the cell where they can turn genes "on" and "off." And the flow of hormones can be affected by environmental conditions, such as light, day length, nutrition, and behavior. Numerous studies have shown that external events outside of the original cell and the person, as well as events inside the cell, can excite or inhibit gene expression (Gottlieb, Wahlsten, & Lickliter, 2006). For example, one recent study revealed that an increase in the concentration of stress hormones such as cortisol produced a fivefold increase in DNA damage (Flint & others, 2007). Other research has shown that experiences early in development can alter gene expression and this expression is related to later behavior

A positive result from the Human Genome Project. Shortly after Andrew Gobea was born, his cells were genetically altered to prevent his immune system from failing.

chromosomes Threadlike structures that come in 23 pairs, one member of each pair coming from each parent. Chromosomes contain the genetic substance DNA.

DNA A complex molecule that contains genetic information.

genes Units of hereditary information composed of DNA. Genes direct cells to reproduce themselves and manufacture the proteins that maintain life.


Calvin and Hobbes
by Bill Watterson
YOU'VE BEEN HITTING ROCKS IN THE HOUSE?!
© 1991 Watterson/Distributed by Universal Press Syndicate
WHAT ON EARTH WOULD MAKE YOU DO SOMETHING LIKE THAT?!
POOR GENETIC MATERIAL?
BAD GUESS.
4-17 WATTERSON

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(Francis & others, 2003). In short, a single gene is rarely the source of a protein's genetic information, much less of an inherited trait (Gottlieb, 2007).

GENES AND CHROMOSOMES

Genes are not only collaborative, they are enduring. How do the genes manage to get passed from generation to generation and end up in all of the trillion cells in the body? Three processes explain the heart of the story: mitosis, meiosis, and fertilization.

Mitosis, Meiosis, and Fertilization All cells in your body, except the sperm and egg, have 46 chromosomes arranged in 23 pairs. These cells reproduce by a process called **mitosis.** During mitosis, the cell's nucleus—including the chromosomes—duplicates itself and the cell divides. Two new cells are formed, each containing the same DNA as the original cell, arranged in the same 23 pairs of chromosomes.

However, a different type of cell division—**meiosis**—forms eggs and sperm (or gametes). During meiosis, a cell of the testes (in men) or ovaries (in women) duplicates its chromosomes but then divides twice, thus forming four cells, each of which has only half of the genetic material of the parent cell (Klug & others, 2010). By the end of meiosis, each egg or sperm has 23 unpaired chromosomes.

During **fertilization,** an egg and a sperm fuse to create a single cell, called a **zygote** (see Figure 2.4). In the zygote, the 23 unpaired chromosomes from the egg and the 23 unpaired chromosomes from the sperm combine to form one set of 23 paired chromosomes—one chromosome of each pair from the mother's egg and the other from the father's sperm. In this manner, each parent contributes half of the offspring's genetic material.

Figure 2.5 shows 23 paired chromosomes of a male and a female. The members of each pair of chromosomes are both similar and different: Each chromosome in the pair contains varying forms of the same genes, at the same location on the chromosome. A gene for hair color, for example, is located on both members of one pair of chromosomes, in the same location on each. However, one of those chromosomes might carry the gene for blond hair; the other chromosome in the pair might carry the gene for brown hair.

Do you notice any obvious differences between the chromosomes of the male and the chromosomes of the female in Figure 2.5? The difference lies in the 23rd pair. Ordinarily, in females this pair consists of two chromosomes called X chromosomes; in males, the 23rd pair consists of an X and a Y chromosome. The presence of a Y chromosome is what makes an individual male.

Sources of Variability Combining the genes of two parents in offspring increases genetic variability in the population, which is valuable for a species because it

FIGURE **2.4**

A SINGLE SPERM PENETRATING AN EGG AT THE POINT OF FERTILIZATION

mitosis Cellular reproduction in which the cell's nucleus duplicates itself with two new cells being formed, each containing the same DNA as the parent cell, arranged in the same 23 pairs of chromosomes.

meiosis A specialized form of cell division that occurs to form eggs and sperm (or gametes).

fertilization A stage in reproduction whereby an egg and a sperm fuse to create a single cell, called a zygote.

zygote A single cell formed through fertilization.

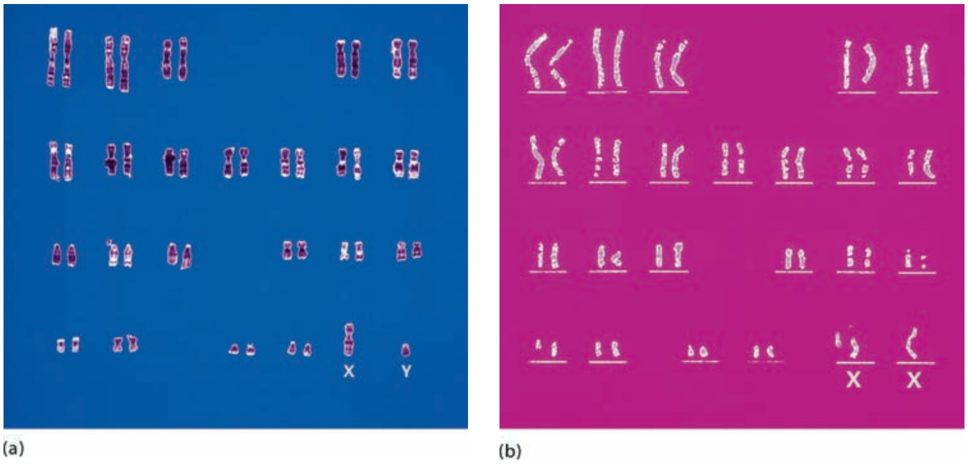

FIGURE **2.5**

THE GENETIC DIFFERENCE BETWEEN MALES AND FEMALES. Set (*a*) shows the chromosome structure of a male, and set (*b*) shows the chromosome structure of a female. The last pair of 23 pairs of chromosomes is in the bottom right box of each set. Notice that the Y chromosome of the male is smaller than the X chromosome of the female. To obtain this kind of chromosomal picture, a cell is removed from a person's body, usually from the inside of the mouth. The chromosomes are stained by chemical treatment, magnified extensively, and then photographed.

provides more characteristics for natural selection to operate on (Starr, 2011). In fact, the human genetic process creates several important sources of variability.

First, the chromosomes in the zygote are not exact copies of those in the mother's ovaries and the father's testes. During the formation of the sperm and egg in meiosis, the members of each pair of chromosomes are separated, but which chromosome in the pair goes to the gamete is a matter of chance. In addition, before the pairs separate, pieces of the two chromosomes in each pair are exchanged, creating a new combination of genes on each chromosome (Mader, 2011). Thus, when chromosomes from the mother's egg and the father's sperm are brought together in the zygote, the result is a truly unique combination of genes (Starr, Evers, & Starr, 2010).

If each zygote is unique, how do identical twins like those discussed in the opening of the chapter exist? *Identical twins* (also called monozygotic twins) develop from a single zygote that splits into two genetically identical replicas, each of which becomes a person. *Fraternal twins* (called dizygotic twins) develop from separate eggs and separate sperm, making them genetically no more similar than ordinary siblings.

Another source of variability comes from DNA (Brooker, 2011). Chances, a mistake by cellular machinery, or damage from an environmental agent such as radiation may produce a *mutated gene*, which is a permanently altered segment of DNA (Lewis, 2010).

There is increasing interest in studying *susceptibility genes*, those that make the individual more vulnerable to specific diseases or acceleration of aging, and *longevity genes*, those that make the individual less vulnerable to certain diseases and be more likely to live to an older age (Marques, Markus, & Morris, 2010; Tacutu, Budovsky, & Fraifeld, 2010). Even when their genes are identical, however, people vary. The difference between genotypes and phenotypes helps us to understand this source of variability. All of a person's genetic material makes up his or her **genotype.** However, not all of the genetic material is apparent in our observed and measurable characteristics. A **phenotype** consists of observable characteristics. Phenotypes include physical characteristics (such as height, weight, and hair color) and psychological characteristics (such as personality and intelligence).

For each genotype, a range of phenotypes can be expressed, providing another source of variability (Gottlieb, 2007; Meaney, 2010). An individual can inherit the genetic potential to grow very large, for example, but good nutrition, among other things, will be essential to achieving that potential.

GENETIC PRINCIPLES

What determines how a genotype is expressed to create a particular phenotype? Much is unknown about the answer to this question (Starr, 2011). However, a number of genetic principles have been discovered, among them those of dominant-recessive genes, sex-linked genes, genetic imprinting, and polygenically determined characteristics.

genotype A person's genetic heritage; the actual genetic material.

phenotype The way an individual's genotype is expressed in observed and measurable characteristics.

Dominant-Recessive Genes Principle In some cases, one gene of a pair always exerts its effects; it is *dominant*, overriding the potential influence of the other gene, called the recessive gene. This is the *dominant-recessive genes principle*. A recessive gene exerts its influence only if the two genes of a pair are both recessive. If you inherit a recessive gene for a trait from each of your parents, you will show the trait. If you inherit a recessive gene from only one parent, you may never know you carry the gene. Brown hair, farsightedness, and dimples rule over blond hair, nearsightedness, and freckles in the world of dominant-recessive genes.

Can two brown-haired parents have a blond-haired child? Yes, they can. Suppose that each parent has a dominant gene for brown hair and a recessive gene for blond hair. Since dominant genes override recessive genes, the parents have brown hair, but both are carriers of blondness and pass on their recessive genes for blond hair. With no dominant gene to override them, the recessive genes can make the child's hair blond.

Sex-Linked Genes Most mutated genes are recessive. When a mutated gene is carried on the X chromosome, the result is called *X-linked inheritance*. The implications for males may be very different from those for females (Agrelo & Wutz, 2010). Remember that males have only one X chromosome. Thus, if there is an altered, disease-creating gene on the X chromosome, males have no "backup" copy to counter the harmful gene and therefore may carry an X-linked disease. However, females have a second X chromosome, which is likely to be unchanged. As a result, they are not likely to have the X-linked disease. Thus, most individuals who have X-linked diseases are males. Females who have one changed copy of the X gene are known as "carriers," and they usually do not show any signs of the X-linked disease. Hemophilia and fragile-X syndrome, which we will discuss later in the chapter, are examples of X-linked inheritance diseases (Rogaev & others, 2009).

Genetic Imprinting Genetic imprinting occurs when the expression of a gene has different effects depending on whether the mother or the father passed on the gene (Zaitoun & others, 2010). A chemical process "silences" one member of the gene pair. For example, as a result of imprinting, only the maternally derived copy of the expressed gene might be active, while the paternally derived copy of the same expressed gene is silenced—or vice versa. Only a small percentage of human genes appear to undergo imprinting, but it is a normal and important aspect of development (Koerner & Barlow, 2010). When imprinting goes awry, development is disturbed, as in the case of Beckwith-Wiedemann syndrome, a growth disorder, and Wilms tumor, a type of cancer (Hartwig & others, 2010).

Polygenic Inheritance Genetic transmission is usually more complex than the simple examples we have examined thus far (Brooker, 2011). Few characteristics reflect the influence of only a single gene or pair of genes. Most are determined by the interaction of many different genes; they are said to be polygenically determined (Meaney, 2010). Even a simple characteristic such as height, for example, reflects the interaction of many genes, as well as the influence of the environment. Most diseases, such as cancer and diabetes, develop as a consequence of complex gene interactions and environmental factors (Ekeblad, 2010; Vimaleswaran & Loos, 2010).

The term *gene-gene interaction* is increasingly used to describe studies that focus on the interdependence of two or more genes in influencing characteristics, behavior, diseases, and development (Costanzo & others, 2010). For example, recent studies have documented gene-gene interaction in cancer (Chen & others, 2009) and cardiovascular disease (Jylhava & others, 2009).

CHROMOSOMAL AND GENE-LINKED ABNORMALITIES

Sometimes, abnormalities characterize the genetic process. Some of these abnormalities involve whole chromosomes that do not separate properly during meiosis. Other abnormalities are produced by harmful genes.

Name	Description	Treatment	Incidence
Down syndrome	An extra chromosome causes mild to severe retardation and physical abnormalities.	Surgery, early intervention, infant stimulation, and special learning programs	1 in 1,900 births at age 20 1 in 300 births at age 35 1 in 30 births at age 45
Klinefelter syndrome (XXY)	An extra X chromosome causes physical abnormalities.	Hormone therapy can be effective	1 in 600 male births
Fragile X syndrome	An abnormality in the X chromosome can cause mental retardation, learning disabilities, or short attention span.	Special education, speech and language therapy	More common in males than in females
Turner syndrome (XO)	A missing X chromosome in females can cause mental retardation and sexual underdevelopment.	Hormone therapy in childhood and puberty	1 in 2,500 female births
XYY syndrome	An extra Y chromosome can cause above-average height.	No special treatment required	1 in 1,000 male births

FIGURE **2.6**

SOME CHROMOSOMAL ABNORMALITIES. The treatments for these abnormalities do not necessarily erase the problem but may improve the individual's adaptive behavior and quality of life.

Chromosomal Abnormalities Sometimes, when a gamete is formed, the male's sperm and/or the female's ovum do not have their normal set of 23 chromosomes. The most notable examples involve Down syndrome and abnormalities of the sex chromosomes (see Figure 2.6).

Down Syndrome An individual with **Down syndrome** has a round face, a flattened skull, an extra fold of skin over the eyelids, a protruding tongue, short limbs, and retardation of motor and mental abilities (Fidler, 2008). The syndrome is caused by the presence of an extra copy of chromosome 21. It is not known why the extra chromosome is present, but the health of the male sperm or female ovum may be involved.

Down syndrome appears approximately once in every 700 live births. Women between the ages of 16 and 34 are less likely to give birth to a child with Down syndrome than are younger or older women. African American children are rarely born with Down syndrome.

These athletes, several of whom have Down syndrome, are participating in a Special Olympics competition. Notice the distinctive facial features of the individuals with Down syndrome, such as a round face and a flattened skull. *What causes Down syndrome?*

Sex-Linked Chromosomal Abnormalities Recall that a newborn normally has either an X and a Y chromosome, or two X chromosomes. Human embryos must possess at least one X chromosome to be viable. The most common sex-linked chromosomal abnormalities involve the presence of an extra chromosome (either an X or Y) or the absence of one X chromosome in females.

Klinefelter syndrome is a genetic disorder in which males have an extra X chromosome, making them XXY instead of XY. Males with this disorder have undeveloped testes, and they usually have enlarged breasts and become tall (Ross & others, 2008). Klinefelter syndrome occurs approximately once in every 600 live male births.

Fragile X syndrome is a genetic disorder that results from an abnormality in the X chromosome, which becomes constricted and often breaks. Mental deficiency often is an outcome, but it may take the form of mental retardation, a learning disability, or a short attention span. A recent study revealed that boys with fragile X syndrome were characterized by cognitive deficits in inhibition, memory, and planning (Hooper & others, 2008). This disorder occurs more frequently

Down syndrome A chromosomally transmitted form of mental retardation, caused by the presence of an extra copy of chromosome 21.

Klinefelter syndrome A chromosomal disorder in which males have an extra X chromosome, making them XXY instead of XY.

fragile X syndrome A genetic disorder involving an abnormality in the X chromosome, which becomes constricted and often breaks.

in males than in females, possibly because the second X chromosome in females negates the effects of the other abnormal X chromosome (Gomez-Raposo & others, 2010).

Turner syndrome is a chromosomal disorder in females in which either an X chromosome is missing, making the person XO instead of XX, or part of one X chromosome is deleted. Females with Turner syndrome are short in stature and have a webbed neck. They might be infertile and have difficulty in mathematics, but their verbal ability is often quite good (Murphy & Mazzocco, 2008). Turner syndrome occurs in approximately 1 of every 2,500 live female births.

The **XYY syndrome** is a chromosomal disorder in which the male has an extra Y chromosome (Isen & Baker, 2008). Early interest in this syndrome focused on the belief that the extra Y chromosome found in some males contributed to aggression and violence. However, researchers subsequently found that XYY males are no more likely to commit crimes than are XY males (Witkin & others, 1976).

Gene-Linked Abnormalities Abnormalities can be produced not only by an uneven number of chromosomes, but also by harmful genes. More than 7,000 such genetic disorders have been identified, although most of them are rare.

Phenylketonuria (PKU) is a genetic disorder in which the individual cannot properly metabolize phenylalanine, an amino acid. It results from a recessive gene and occurs about once in every 10,000 to 20,000 live births. Today, phenylketonuria is easily detected, and it is treated by a diet that prevents an excess accumulation of phenylalanine. If phenylketonuria is left untreated, however, excess phenylalanine builds up in the child, producing mental retardation and hyperactivity. Phenylketonuria accounts for approximately 1 percent of institutionalized individuals who are mentally retarded, and it occurs primarily in Whites.

The story of phenylketonuria has important implications for the nature-nurture issue. Although phenylketonuria is a genetic disorder (nature), how or whether a gene's influence in phenylketonuria is played out depends on environmental influences since the disorder can be treated (nurture) (van Spronsen & Enns, 2010). That is, the presence of a genetic defect does not inevitably lead to the development of the disorder if the individual develops in the right environment (one free of phenylalanine) (Grosse, 2010). This is one example of the important principle of heredity-environment interaction. Under one environmental condition (phenylalanine in the diet), mental retardation results, but when other nutrients replace phenylalanine, intelligence develops in the normal range. The same genotype has different outcomes depending on the environment (in this case, the nutritional environment).

During a physical examination for a college football tryout, Jerry Hubbard, 32, learned that he carried the gene for sickle-cell anemia. Daughter Sara is healthy but daughter Avery (in the print dress) has sickle-cell anemia. *If you were a genetic counselor would you recommend that this family have more children? Explain.*

Sickle-cell anemia, which occurs most often in African Americans, is a genetic disorder that impairs the body's red blood cells. Red blood cells carry oxygen to the body's cells and are usually shaped like a disk. In sickle-cell anemia, a recessive gene causes the red blood cell to become a hook-shaped "sickle" that cannot carry oxygen properly and dies quickly. As a result, the body's cells do not receive adequate oxygen, causing anemia and early death (Benson & Therrell, 2010). About 1 in 400 African American babies is affected by sickle-cell anemia. One in 10 African Americans is a carrier, as is 1 in 20 Latin Americans. A National Institutes of Health (2008) panel recently concluded that the only FDA-approved drug (hydroxyurea) to treat sickle-cell anemia in adolescents and adults has been underutilized. Research is currently being conducted in a study named Baby HUG to determine if the drug works with babies.

Other diseases that result from genetic abnormalities include cystic fibrosis, diabetes, hemophilia, Huntington's disease, spina bifida, and Tay-Sachs disease.

Turner syndrome A chromosome disorder in females in which either an X chromosome is missing, making the person XO instead of XX, or the second X chromosome is partially deleted.

XYY syndrome A chromosomal disorder in which males have an extra Y chromosome.

phenylketonuria (PKU) A genetic disorder in which an individual cannot properly metabolize an amino acid. PKU is now easily detected but, if left untreated, results in mental retardation and hyperactivity.

sickle-cell anemia A genetic disorder that affects the red blood cells and occurs most often in people of African descent.

Name	Description	Treatment	Incidence
Cystic fibrosis	Glandular dysfunction that interferes with mucus production; breathing and digestion are hampered, resulting in a shortened life span.	Physical and oxygen therapy, synthetic enzymes, and antibiotics; most individuals live to middle age.	1 in 2,000 births
Diabetes	Body does not produce enough insulin, which causes abnormal metabolism of sugar.	Early onset can be fatal unless treated with insulin.	1 in 2,500 births
Hemophilia	Delayed blood clotting causes internal and external bleeding.	Blood transfusions/injections can reduce or prevent damage due to internal bleeding.	1 in 10,000 males
Huntington's disease	Central nervous system deteriorates, producing problems in muscle coordination and mental deterioration.	Does not usually appear until age 35 or older; death likely 10 to 20 years after symptoms appear.	1 in 20,000 births
Phenylketonuria (PKU)	Metabolic disorder that, left untreated, causes mental retardation.	Special diet can result in average intelligence and normal life span.	1 in 10,000 to 1 in 20,000 births
Sickle-cell anemia	Blood disorder that limits the body's oxygen supply; it can cause joint swelling, as well as heart and kidney failure.	Penicillin, medication for pain, antibiotics, and blood transfusions.	1 in 400 African American children (lower among other groups)
Spina bifida	Neural tube disorder that causes brain and spine abnormalities.	Corrective surgery at birth, orthopedic devices, and physical/medical therapy.	2 in 1,000 births
Tay-Sachs disease	Deceleration of mental and physical development caused by an accumulation of lipids in the nervous system.	Medication and special diet are used, but death is likely by 5 years of age.	1 in 30 American Jews is a carrier.

FIGURE **2.7**

SOME GENE-LINKED ABNORMALITIES

Figure 2.7 provides further information about these diseases. Someday, scientists may identify why these and other genetic abnormalities occur and discover how to cure them. The Human Genome Project has already linked specific DNA variations with increased risk of a number of diseases and conditions, including Huntington's disease (in which the central nervous system deteriorates), some forms of cancer, asthma, diabetes, hypertension, and Alzheimer's disease (Velagaleti & O'Donnell, 2010; Viet & Schmidt, 2010).

Dealing With Genetic Abnormalities Every individual carries DNA variations that might predispose the person to serious physical disease or mental disorder. But not all individuals who carry a genetic disorder display the disorder. Other genes or developmental events sometimes compensate for genetic abnormalities (Gottlieb, Wahlsten, & Lickliter, 2006). For example, recall the earlier example of phenylketonuria: Even though individuals might carry the genetic disorder of phenylketonuria, it is not expressed when phenylalanine is replaced by other nutrients in their diet.

Thus, genes are not destiny, but genes that are missing, nonfunctional, or mutated can be associated with disorders (Zaghloul & Katsanis, 2010). Identifying such genetic flaws could enable doctors to predict an individual's risks, recommend healthy practices, and prescribe the safest and most effective drugs (Wider, Foroud, & Wszolek, 2010). A decade or two from now, parents of a newborn baby may be able to leave the hospital with a full genome analysis of their offspring that reveals disease risks.

However, this knowledge might bring important costs as well as benefits. Who would have access to a person's genetic profile? An individual's ability to land and hold jobs or obtain insurance might be threatened if it is known that a person is considered at risk for some disease. For example, should an airline pilot or a neurosurgeon who is predisposed to develop a disorder that makes one's hands shake be required to leave that job early?

connecting with careers

Holly Ishmael, Genetic Counselor

Holly Ishmael is a genetic counselor at Children's Mercy Hospital in Kansas City. She obtained an undergraduate degree in psychology and then a master's degree in genetic counseling from Sarah Lawrence College.

Genetic counselors, like Ishmael, work as members of a health care team, providing information and support to families with birth defects or genetic disorders. They identify families at risk by analyzing inheritance patterns and explore options with the family. Some genetic counselors, like Ishmael, become specialists in prenatal and pediatric genetics; others might specialize in cancer genetics or psychiatric genetic disorders.

Ishmael says, "Genetic counseling is a perfect combination for people who want to do something science-oriented, but need human contact and don't want to spend all of their time in a lab or have their nose in a book" (Rizzo, 1999, p. 3).

Holly Ishmael (*left*) in a genetic counseling session.

Genetic counselors have specialized graduate degrees in the areas of medical genetics and counseling. They enter graduate school with undergraduate backgrounds from a variety of disciplines, including biology, genetics, psychology, public health, and social work. There are approximately 30 graduate genetic counseling programs in the United States. If you are interested in this profession, you can obtain further information from the National Society of Genetic Counselors at www.nsgc.org.

For more information about what genetic counselors do, see page 48 in the Careers in Life-Span Development appendix.

Genetic counselors, usually physicians or biologists who are well-versed in the field of medical genetics, understand the kinds of problems just described, the odds of encountering them, and helpful strategies for offsetting some of their effects (Boks & others, 2010). To read about the career and work of a genetic counselor, see *Connecting With Careers*.

Review *Connect* Reflect

LG2 Describe what genes are and how they influence human development.

Review

- What are genes?
- How are genes passed on?
- What basic principles describe how genes interact?
- What are some chromosome and gene-linked abnormalities?

Connect

- Would you want to be able to access a full genome analysis of your offspring? Why or why not?

Reflect *Your Own Personal Journey of Life*

- Can you identify in yourself or a friend the likelihood of the influence of dominant and/or recessive genes? Explain.

3 Reproductive Challenges and Choices

LG3 Identify some important reproductive challenges and choices.

- Prenatal Diagnostic Tests
- Infertility and Reproductive Technology
- Adoption

A 6-month-old infant poses with the ultrasound sonography record taken four months into the baby's prenatal development. *What is ultrasound sonography?*

The facts and principles we have discussed regarding meiosis, genetics, and genetic abnormalities are a small part of the recent explosion of knowledge about human biology. This knowledge not only helps us understand human development but also opens up many new choices to prospective parents, choices that can also raise ethical questions.

PRENATAL DIAGNOSTIC TESTS

One choice open to prospective mothers is the extent to which they should undergo prenatal testing. A number of tests can indicate whether a fetus is developing normally, including ultrasound sonography, fetal MRI, chorionic villus sampling, amniocentesis, maternal blood screening, and noninvasive prenatal diagnosis.

An ultrasound test is often conducted seven weeks into a pregnancy and at various times later in pregnancy (Cignini & others, 2010). *Ultrasound sonography* is a prenatal medical procedure in which high-frequency sound waves are directed into the pregnant woman's abdomen. The echo from the sounds is transformed into a visual representation of the fetus's inner structures. This technique can detect many structural abnormalities in the fetus, including microencephaly, a form of mental retardation involving an abnormally small brain; it can also determine the number of fetuses and give clues to the baby's sex (Gerards & others, 2008). There is virtually no risk to the woman or fetus in this test.

The development of brain-imaging techniques has led to increasing use of *fetal MRI* to diagnose fetal malformations (Daltro & others, 2010; Duczkowska & others, 2010) (see Figure 2.8). MRI stands for magnetic resonance imaging and uses a powerful magnet and radio images to generate detailed images of the body's organs and structures. Currently, ultrasound is still the first choice in fetal screening, but fetal MRI can provide more detailed images than ultrasound. In many instances, ultrasound will indicate a possible abnormality and then fetal MRI will be used to obtain a clearer, more detailed image (Obenauer & Maestre, 2008). Among the fetal malformations that fetal MRI may be able to detect better than ultrasound sonography are certain central nervous system, chest, gastrointestinal, genital/urinary, and placental abnormalities (Baysinger, 2010; Panigrahy, Borzaga, & Blumi, 2010; Weston, 2010).

At some point between the 10th and 12th weeks of pregnancy, chorionic villus sampling may be used to detect genetic defects and chromosomal abnormalities, such as the ones discussed in the previous section. *Chorionic villus sampling (CVS)* is a prenatal medical procedure in which a small sample of the placenta (the vascular organ that links the fetus to the mother's uterus) is removed. Diagnosis takes about 10 days. There is a small risk of limb deformity when CVS is used.

Between the 15th and 18th weeks of pregnancy, amniocentesis may be performed. *Amniocentesis* is a prenatal medical procedure in which a

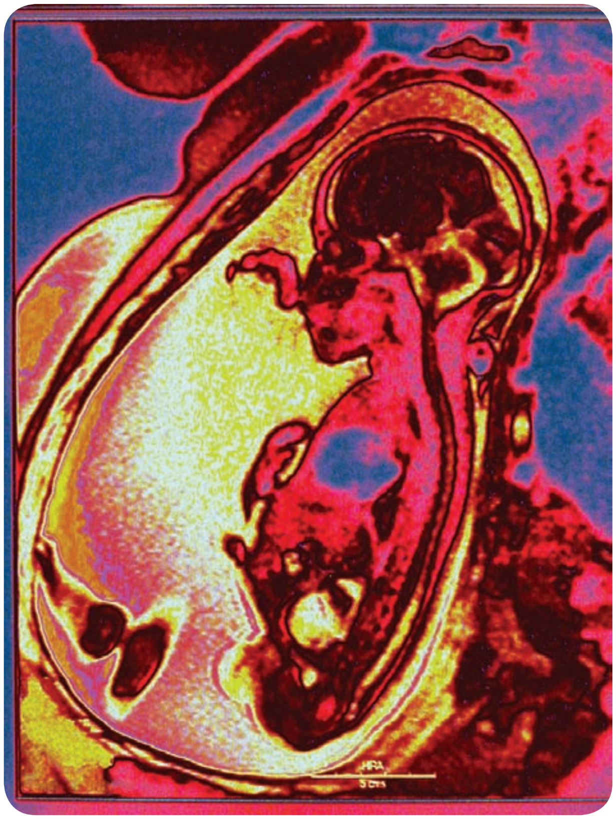

FIGURE **2.8**

A FETAL MRI, WHICH IS INCREASINGLY BEING USED IN PRENATAL DIAGNOSIS OF FETAL MALFORMATIONS

sample of amniotic fluid is withdrawn by syringe and tested for chromosomal or metabolic disorders. The amniotic fluid is found within the amnion, a thin sac in which the embryo is suspended. Ultrasound sonography is often used during amniocentesis so that the syringe can be placed precisely. The later amniocentesis is performed, the better its diagnostic potential. The earlier it is performed, the more useful it is in deciding how to handle a pregnancy. It may take two weeks for enough cells to grow and amniocentesis test results to be obtained. Amniocentesis brings a small risk of miscarriage: About 1 woman in every 200 to 300 miscarries after amniocentesis.

Both amniocentesis and chorionic villus sampling provide valuable information about the presence of birth defects, but they also raise difficult issues for parents about whether an abortion should be obtained if birth defects are present (Quadrelli & others, 2007; Zhang & others, 2010). Chorionic villus sampling allows a decision to be made sooner, near the end of the first 12 weeks of pregnancy, when abortion is safer and less traumatic than later. Although earlier reports indicated that chorionic villus sampling brings a slightly higher risk of pregnancy loss than amniocentesis, a U.S. study of more than 40,000 pregnancies found that loss rates for CVS decreased from 1998 to 2003 and that there is no longer a difference in pregnancy loss risk between CVS and amniocentesis (Caughey, Hopkins, & Norton, 2006).

During the 16th to 18th weeks of pregnancy, maternal blood screening may be performed. *Maternal blood screening* identifies pregnancies that have an elevated risk for birth defects such as spina bifida (a defect in the spinal cord) and Down syndrome (Bustamante-Aragones & others, 2010). The current blood test is called the *triple screen* because it measures three substances in the mother's blood. After an abnormal triple screen result, the next step is usually an ultrasound examination. If an ultrasound does not explain the abnormal triple screen results, amniocentesis is typically used.

Noninvasive prenatal diagnosis (NIPD) is increasingly being explored as an alternative to such procedures as chorionic villus sampling and amniocentesis (Susman & others, 2010). At this point, NIPD has mainly focused on the isolation and examination of fetal cells circulating in the mother's blood and analysis of cell-free fetal DNA in maternal plasma (Prakash, Powell, & Geva, 2010).

Researchers already have used NIPD to successfully test for genes inherited from a father that cause cystic fibrosis and Huntington's disease. They also are exploring the potential for using NIPD to diagnose a baby's sex, as early as five weeks after conception, and Down syndrome (Avent & others, 2008). Being able to detect an offspring's sex and various diseases and defects so early raises ethical concerns about couples' motivation to terminate a pregnancy (Benn & Chapman, 2010).

developmental **connection**

Biological Processes. Discover what the development of the fetus is like at the time chorionic villus sampling and amniocentesis can be used. Chapter 3, Figure 3.3, p. 84

INFERTILITY AND REPRODUCTIVE TECHNOLOGY

Recent advances in biological knowledge have also opened up many choices for infertile individuals (Kamel, 2010). Approximately 10 to 15 percent of couples in the United States experience infertility, which is defined as the inability to conceive a child after 12 months of regular intercourse without contraception. The cause of infertility can rest with the woman or the man (Verhaak & others, 2010; Walsh, Pora, & Turek, 2009). The woman may not be ovulating (releasing eggs to be fertilized), she may be producing abnormal ova, her fallopian tubes by which ova normally reach the womb may be blocked, or she may have a disease that prevents implantation of the embryo into the uterus. The man may produce too few sperm, the sperm may lack motility (the ability to move adequately), or he may have a blocked passageway (Kini & others, 2010).

A technician using a micro-needle to inject human sperm into a human egg cell as part of an in vitro fertilization procedure. The injected sperm fertilizes the egg, and the resulting zygote is then grown in the laboratory until it reaches an early stage of embryonic development. Then it is implanted in the uterus.

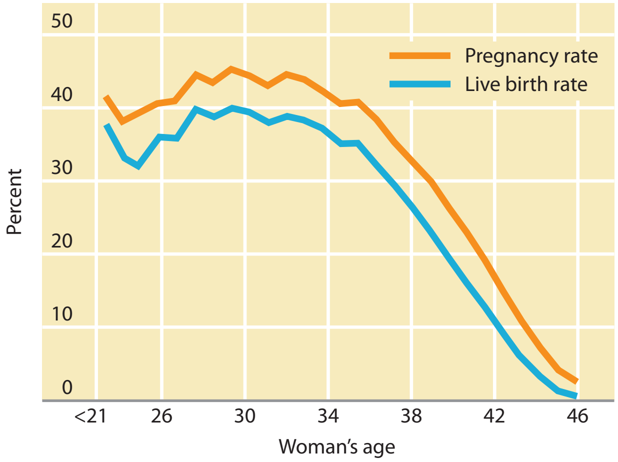

FIGURE **2.9**

SUCCESS RATES OF IN VITRO FERTILIZATION VARY ACCORDING TO THE WOMAN'S AGE

In the United States, more than 2 million couples seek help for infertility every year. In some cases of infertility, surgery may correct the cause; in others, hormone-based drugs may improve the probability of having a child. Of the 2 million couples who seek help for infertility every year, about 40,000 try high-tech assisted reproduction. By far the most common technique used is *in vitro fertilization (IVF)*, in which eggs and sperm are combined in a laboratory dish. If any eggs are successfully fertilized, one or more of the resulting fertilized eggs is transferred into the woman's uterus. A national study in the United States by the Centers for Disease Control and Prevention (2006) found the success rate of IVF depends on the mother's age (see Figure 2.9).

The creation of families by means of the new reproductive technologies raises important questions about the physical and psychological consequences for children (Steel & Sutcliffe, 2010; Wisborg, Ingerslev, & Henriksen, 2010). One result of fertility treatments is an increase in multiple births. Twenty-five to 30 percent of pregnancies achieved by fertility treatments—including in vitro fertilization—now result in multiple births. A recent *meta-analysis* (a statistical technique that combines the results of multiple studies to determine the strength of the effect) revealed that in vitro fertilization twins have a slight increased risk of low birth weight (McDonald & others, 2010) and another meta-analysis found that in vitro fertilization singletons have a significant risk of low birth weight (McDonald & others, 2009). To read about a study that addresses longer-term consequences of in vitro fertilization, see *Connecting Through Research.*

An increasing number of Hollywood celebrities are adopting children from developing countries. Actress Angelina Jolie (*above*) with her adopted children, carrying adopted daughter Zahara with adopted sons Maddox and Pax alongside them.

ADOPTION

Although surgery and fertility drugs can sometimes solve the infertility problem, another choice is to adopt a child. Adoption is the social and legal process by which a parent-child relationship is established between persons unrelated at birth.

The Increased Diversity of Adopted Children and Adoptive Parents A number of changes have characterized adoptive children and adoptive parents in the last three to four decades (Brodzinsky & Pinderhughes, 2002). In the first half of the 20th century, most U.S. adopted children were healthy, non–Latino White infants who were adopted at birth or soon after; however, in recent decades as abortion became legal and contraception increased, fewer of these infants became available for adoption. Increasingly, U.S. couples adopted a much wider diversity of children—from other countries, from other ethnic groups, children with physical and/or mental problems, and children who had been neglected or abused.

Changes also have characterized adoptive parents in the last three to four decades (Brodzinsky & Pinderhughes, 2002). In the first half of the 20th century, most adoptive parents were from non–Latino White, middle or upper socioeconomic status backgrounds who were married and did not have any type of disability. However, in recent decades, increased diversity has characterized adoptive parents. Many adoption agencies today have no income requirements for adoptive parents and now allow adults from a wide range of backgrounds to adopt children, including single adults, gay and lesbian adults, and older adults.

Outcomes for Adopted Children How do adopted children fare after they are adopted? Children who are adopted very early in their lives are more likely to have positive outcomes than children adopted later in life. In one study, the later adoption occurred, the more problems the adoptees had. Infant adoptees had the fewest adjustment difficulties; those adopted after they were 10 years of age had the most problems (Sharma, McGue, & Benson, 1996).

connecting through research

Do Children Conceived Through In Vitro Fertilization Show Significant Differences in Developmental Outcomes in Adolescence?

A longitudinal study examined 34 in vitro fertilization families, 49 adoptive families, and 38 families with a naturally conceived child (Golombok, MacCallum, & Goodman, 2001). Each type of family included a similar portion of boys and girls. Also, the age of the young adolescents did not differ according to family type (mean age of 11 years, 11 months).

Children's socioemotional development was assessed by (1) interviewing the mother and obtaining detailed descriptions of any problems the child might have; (2) administering a strengths and difficulties questionnaire to the child's mother and teacher; and (3) administering the Social Adjustment Inventory for Children and Adolescents, which examines functioning in school, peer relationships, and self-esteem.

No significant differences between the children from the in vitro fertilization, adoptive, and naturally conceiving families were found. The results from the Social Adjustment Inventory for Children and Adolescents are shown in Figure 2.10. Another study also revealed no psychological differences between IVF babies and those not conceived by IVF, but more research is needed to reach firm conclusions in this area (Goldbeck & others, 2010).

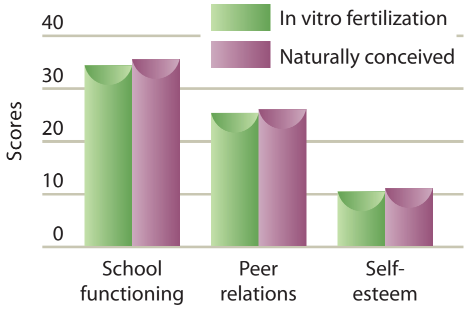

FIGURE **2.10**

SOCIOEMOTIONAL FUNCTIONING OF CHILDREN CONCEIVED THROUGH IN VITRO FERTILIZATION OR NATURALLY CONCEIVED. This graph shows the results of a study that compared the socioemotional functioning of young adolescents who had either been conceived through in vitro fertilization (IVF) or naturally conceived (Golombok, MacCallum, & Goodman, 2001). For each type of family, the study included a similar portion of boys and girls and children of similar age (mean age of 11 years, 11 months). Although the means for the naturally conceived group were slightly higher, this is likely due to chance: There were no significant differences between the groups.

In general, adopted children and adolescents are more likely to experience psychological and school-related problems than nonadopted children (Keyes & others, 2008). For example, a recent meta-analysis revealed that adoptees were far more likely to be using mental health services than their nonadopted counterparts (Juffer & van IJzendoorn, 2005). Adopted children also showed more behavior problems than nonadoptees, but this difference was small. A recent large-scale study found that adopted children are more likely to have a learning disability than nonadopted children (Altarac & Saroha, 2007).

Research that contrasts adopted and nonadopted adolescents has also found positive characteristics among the adopted adolescents. For example, in one study, although adopted adolescents were more likely than nonadopted adolescents to use illicit drugs and to engage in delinquent behavior, the adopted adolescents were also less likely to be withdrawn and engaged in more prosocial behavior, such as being altruistic, caring, and supportive of others (Sharma, McGue, & Benson, 1996).

However, the vast majority of adopted children (including those adopted at older ages, transracially, and across national borders) adjust effectively, and their parents report considerable satisfaction with their decision to adopt (Brodzinsky & Pinderhughes, 2002; Castle & others, 2009). In one recent national study, there were no differences in the antisocial behavior of adopted and nonadopted young adults (Grotevant & others, 2006). A recent research review of 88 studies also revealed no difference in the self-esteem of adopted and nonadopted children, as

connecting development to life

Parenting Adopted Children

Many of the keys to effectively parenting adopted children are no different from those for effectively parenting biological children: Be supportive and caring, be involved and monitor the child's behavior and whereabouts, be a good communicator, and help the child to learn to develop self-control. However, parents of adopted children face some unique circumstances (Fontenot, 2007). These parents need to recognize the differences involved in adoptive family life, communicate about these differences, show respect for the birth family, and support the child's search for self and identity.

Following are some of the problems parents face when their adopted children are at different points in development and some recommendations for how to handle these problems (Brodzinsky & Pinderhughes, 2002):

- **Infancy.** Researchers have found few differences in the attachment that adopted and nonadopted infants form with their parents. However, attachment can become problematic if parents have unresolved fertility issues or the child does not meet the parents' expectations. Counselors can help prospective adoptive parents develop realistic expectations.
- **Early childhood.** Because many children begin to ask where they came from when they are about 4 to 6 years old, this is a natural time to begin to talk in simple ways to children about their adoption status (Warshak, 2007). Some parents (although not as many as in the past) decide not to tell their children about the adoption. This secrecy may create psychological risks for the child if he or she later finds out about the adoption.
- **Middle and late childhood.** During the elementary school years, children begin to show more interest in their origins and may ask questions related to where they came from, what their parents looked like, and why their parents abandoned them.

  As they grow older, children may develop mixed feelings about being adopted and question their adoptive parents' explanations. It is important for adoptive parents to recognize that this ambivalence is normal. Also, problems may arise from the desire of adoptive parents to make life too perfect for the adoptive child and to present a perfect image of themselves to the child. The result too often is that adopted children feel that they cannot release any angry feelings and openly discuss problems.
- **Adolescence.** Adolescents are likely to develop more abstract and logical thinking, to focus their attention on their bodies, and to search for an identity. These characteristics provide the foundation for adopted adolescents to reflect on their adoption status in more complex ways, such as focusing on how they look so different from their adoptive parents. As they explore their identity, adopted adolescents may have difficulty incorporating their adopted status in positive ways into their identity. It is important for adoptive parents to understand the complexity of the adopted adolescent's identity exploration and be patient with the adolescent's lengthy identity search.

What are some strategies for parenting adopted children at different points in their development?

According to the information presented here and in the preceding text, how can mental health professionals help both adopting parents and adopted children?

well as no differences between transracial and same-race adoptees (Juffer & van IJzendoorn, 2007). Furthermore, adopted children fare much better than children in long-term foster care or in an institutional environment (Bernard & Dozier, 2008). A recent study of infants in China revealed that their cognitive development improved two to six months following their adoption from foster homes and institutions (van den Dries & others, 2010).

In sum, the changes in adoption practice over the last several decades make it difficult to generalize about the average adopted child or average adoptive parent. To read more about adoption, see *Connecting Development to Life,* in which we discuss effective parenting strategies with adopted children.

Review *Connect* Reflect

LG3 Identify some important reproductive challenges and choices.

Review

- What are some common prenatal diagnostic tests?
- What are some techniques that help infertile people to have children?
- How does adoption affect children's development?

Connect

- In Chapter 1, we learned different methods for collecting data. How would you characterize the methods used in prenatal diagnostic testing?

Reflect *Your Own Personal Journey of Life*

- If you were an adult who could not have children, would you want to adopt a child? Why or why not?

4 Heredity and Environment Interaction: The Nature-Nurture Debate

LG4 Explain some of the ways that heredity and environment interact to produce individual differences in development.

- Behavior Genetics
- Heredity-Environment Correlations
- Shared and Nonshared Environmental Experiences
- The Epigenetic View and Gene × Environment (G × E) Interaction
- Conclusions About Heredity-Environment Interaction

Is it possible to untangle the influence of heredity from that of environment and discover the role of each in producing individual differences in development? When heredity and environment interact, how does heredity influence the environment, and vice versa?

Twin studies compare identical twins with fraternal twins. Identical twins develop from a single fertilized egg that splits into two genetically identical organisms. Fraternal twins develop from separate eggs, making them genetically no more similar than nontwin siblings. *What is the nature of the twin study method?*

BEHAVIOR GENETICS

Behavior genetics is the field that seeks to discover the influence of heredity and environment on individual differences in human traits and development. Note that behavior genetics does not determine the extent to which genetics or the environment affects an individual's traits. Instead, what behavior geneticists try to do is to figure out what is responsible for the differences among people—that is, to what extent do people differ because of differences in genes, environment, or a combination of these (Silberg, Maes, & Eaves, 2010). To study the influence of heredity on behavior, behavior geneticists often use either twins or adoption situations (Goldsmith, 2011).

In the most common **twin study,** the behavioral similarity of identical twins (who are genetically identical) is compared with the behavioral similarity of fraternal twins. Recall that although fraternal twins share the same womb, they are no more genetically alike than brothers or sisters. Thus by comparing groups of identical and fraternal twins, behavior geneticists capitalize on the basic knowledge that identical twins are more similar genetically than are fraternal twins (Loehlin, 2010). For example, one study found that conduct problems were more prevalent in identical twins than fraternal twins; the researchers concluded that the study demonstrated an important role for heredity in conduct problems (Scourfield & others, 2004).

behavior genetics The field that seeks to discover the influence of heredity and environment on individuals differences in human traits and development.

twin study A study in which the behavioral similarity of identical twins is compared with the behavioral similarity of fraternal twins.

Heredity-Environment Correlation	Description	Examples
Passive	Children inherit genetic tendencies from their parents, and parents also provide an environment that matches their own genetic tendencies.	Musically inclined parents usually have musically inclined children and they are likely to provide an environment rich in music for their children.
Evocative	The child's genetic tendencies elicit stimulation from the environment that supports a particular trait. Thus genes evoke environmental support.	A happy, outgoing child elicits smiles and friendly responses from others.
Active (niche-picking)	Children actively seek out "niches" in their environment that reflect their own interests and talents and are thus in accord with their genotype.	Libraries, sports fields, and a store with musical instruments are examples of environmental niches children might seek out if they have intellectual interests in books, talent in sports, or musical talents, respectively.

FIGURE **2.11**

EXPLORING HEREDITY-ENVIRONMENT CORRELATIONS

However, several issues complicate interpretation of twin studies. For example, perhaps the environments of identical twins are more similar than the environments of fraternal twins. Adults might stress the similarities of identical twins more than those of fraternal twins, and identical twins might perceive themselves as a "set" and play together more than fraternal twins do. If so, the influence of the environment on the observed similarities between identical and fraternal twins might be very significant.

In an **adoption study,** investigators seek to discover whether the behavior and psychological characteristics of adopted children are more like their those of their adoptive parents, who have provided a home environment, or more like those of their biological parents, who have contributed their heredity (Loehlin, Horn, & Ernst, 2007). Another form of the adoption study compares adoptive and biological siblings.

HEREDITY-ENVIRONMENT CORRELATIONS

The difficulties that researchers encounter when they interpret the results of twin studies and adoption studies reflect the complexities of heredity-environment interaction. Some of these interactions are *heredity-environment correlations,* which means that individuals' genes may influence the types of environments to which they are exposed. In a sense, individuals "inherit" environments that may be related or linked to genetic "propensities." Behavior geneticist Sandra Scarr (1993) described three ways that heredity and environment are correlated (see Figure 2.11):

- **Passive genotype-environment correlations** occur because biological parents, who are genetically related to the child, provide a rearing environment for the child. For example, the parents might have a genetic predisposition to be intelligent and read skillfully. Because they read well and enjoy reading, they provide their children with books to read. The likely outcome is that their children, given their own inherited predispositions from their parents and their book-filled environment, will become skilled readers.
- **Evocative genotype-environment correlations** occur because a child's characteristics elicit certain types of environments. For example, active, smiling children receive more social stimulation than passive, quiet children do. Cooperative, attentive children evoke more pleasant and instructional responses from the adults around them than uncooperative, distractible children do.
- **Active (niche-picking) genotype-environment correlations** occur when children seek out environments that they find compatible and stimulating. *Niche-picking* refers to finding a setting that is suited to one's abilities. Children select from their surrounding environment some aspect that they respond to, learn about, or ignore. Their active selections of environments are related to their particular genotype. For example, outgoing children tend to seek out

adoption study A study in which investigators seek to discover whether, in behavior and psychological characteristics, adopted children are more like their adoptive parents, who provided a home environment, or more like their biological parents, who contributed their heredity. Another form of the adoption study is to compare adoptive and biological siblings.

passive genotype-environment correlations Correlations that exist when the natural parents, who are genetically related to the child, provide a rearing environment for the child.

evocative genotype-environment correlations Correlations that exist when the child's genotype elicits certain types of physical and social environments.

active (niche-picking) genotype-environment correlations Correlations that exist when children seek out environments they find compatible and stimulating.

social contexts in which to interact with people, whereas shy children don't. Children who are musically inclined are likely to select musical environments in which they can successfully perform their skills. How these "tendencies" come about will be discussed shortly under the topic of the epigenetic view.

Scarr observes that the relative importance of the three genotype-environment correlations changes as children develop from infancy through adolescence. In infancy, much of the environment that children experience is provided by adults. Thus, passive genotype-environment correlations are more common in the lives of infants and young children than they are for older children and adolescents who can extend their experiences beyond the family's influence and create their environments to a greater degree.

SHARED AND NONSHARED ENVIRONMENTAL EXPERIENCES

Behavior geneticists have argued that to understand the environment's role in differences between people, we should distinguish between shared and nonshared environments. That is, we should consider experiences that children share in common with other children living in the same home, and experiences that are not shared (Burt, McGue, & Iacono, 2010; Cerda & others, 2010).

Shared environmental experiences are siblings' common experiences, such as their parents' personalities or intellectual orientation, the family's socioeconomic status, and the neighborhood in which they live. By contrast, **nonshared environmental experiences** are a child's unique experiences, both within the family and outside the family, that are not shared with a sibling. Even experiences occurring within the family can be part of the "nonshared environment." For example, parents often interact differently with each sibling, and siblings interact differently with parents. Siblings often have different peer groups, different friends, and different teachers at school.

Behavior geneticist Robert Plomin (2004) has found that shared environment accounts for little of the variation in children's personality or interests. In other words, even though two children live under the same roof with the same parents, their personalities are often very different. Further, Plomin argues that heredity influences the nonshared environments of siblings through the heredity-environment correlations we described earlier. For example, a child who has inherited a genetic tendency to be athletic is likely to spend more time in environments related to sports, and a child who has inherited a tendency to be musically inclined is more likely to spend time in environments related to music.

Tennis stars Venus and Serena Williams. *What might be some shared and nonshared environmental experiences they had while they were growing up that contributed to their tennis stardom?*

What are the implications of Plomin's interpretation of the role of shared and nonshared environments in development? In the *Nurture Assumption*, Judith Harris (1998, 2009) argued that what parents do does not make a difference in their children's and adolescents' behavior. Yell at them. Hug them. Read to them. Ignore them. Harris says it won't influence how they turn out. She argues that genes and peers are far more important than parents in children's and adolescents' development.

Genes and peers do matter, but Harris' descriptions of peer influences do not take into account the complexity of peer contexts and developmental trajectories (Hartup, 2009). In addition, Harris is wrong in saying that parents don't matter. For example, in the early child years parents play an important role in selecting children's peers and indirectly influencing children's development (Baumrind, 1999). A large volume of parenting literature with many research studies documents the importance of parents in children's development (Meaney, 2010; Schultz & others, 2009). We will discuss parents' important roles throughout this book.

developmental **connection**

Parenting. Is quantity or quality more important in parenting? Chapter 8, p. 253

shared environmental experiences Siblings' common environmental experiences, such as their parents' personalities and intellectual orientation, the family's socioeconomic status, and the neighborhood in which they live.

nonshared environmental experiences The child's own unique experiences, both within the family and outside the family, that are not shared by another sibling. Thus, experiences occurring within the family can be part of the "nonshared environment."

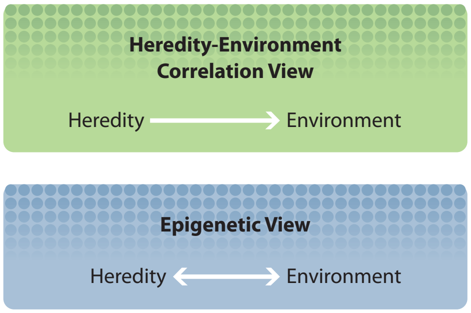

FIGURE **2.12**

COMPARISON OF THE HEREDITY-ENVIRONMENT CORRELATION AND EPIGENETIC VIEWS

THE EPIGENETIC VIEW AND GENE × ENVIRONMENT (G × E) INTERACTION

Critics argue that the concept of heredity-environment correlation gives heredity too much of a one-sided influence in determining development because it does not consider the role of prior environmental influences in shaping the correlation itself (Gottlieb, 2007; Meaney, 2010). However, earlier in the chapter we discussed how genes are collaborative, not determining an individual's traits in an independent manner, but rather in an interactive manner with the environment.

The Epigenetic View In line with the concept of a collaborative gene, Gilbert Gottlieb (2007) emphasizes the **epigenetic view,** which states that development is the result of an ongoing, bidirectional interchange between heredity and the environment. Figure 2.12 compares the heredity-environment correlation and epigenetic views of development.

Let's look at an example that reflects the epigenetic view. A baby inherits genes from both parents at conception. During prenatal development, toxins, nutrition, and stress can influence some genes to stop functioning while others become stronger or weaker. During infancy, the same environmental experiences such as toxins, nutrition, stress, learning, and encouragement continue to modify genetic activity and the activity of the nervous system that directly underlies behavior. Heredity and environment operate together—or collaborate—to produce a person's intelligence, temperament, height, weight, ability to pitch a baseball, ability to read, and so on (Gottlieb, 2007; Meaney, 2010).

Gene × Environment (G × E) Interaction An increasing number of studies are exploring how the interaction of heredity and environment influence development, including interactions that involve specific DNA sequences (Caspi & others, 2010; Keers & others, 2010; Wright & Christiani, 2010). One research study found that individuals who have a short version of a genotype labeled 5-HTTLPR (a gene involving the neurotransmitter serotonin) only have an elevated risk of developing depression if they also have stressful lives (Caspi & others, 2003). Thus, the specific gene did not link directly to the development of depression, but rather interacted with environmental exposure to stress to predict whether individuals would develop depression; however, some studies have not replicated this finding (Goldman & others, 2010; Risch & others, 2009). In a recent study, adults who experienced parental loss as young children were more likely to have unresolved attachment as adults only when they had the short version of the 5-HTTLPR gene (Caspers & others, 2009). The long version of the serotonin transporter gene apparently provided some protection and ability to cope better with parental loss.

developmental **connection**

Attachment. A recent study revealed links between infant attachment, responsive parenting, and the 5-HTTLPR gene. Chapter 6, p. 194

The type of research just described is referred to as **gene × environment (G × E) interaction**—the interaction of a specific measured variation in the DNA and a specific measured aspect of the environment (Caspi & others, 2010; Seabrook & Avison, 2010). The field of *pharmacogenetics* is the study of gene-environment interaction involving the individual's genotype and drug treatment (the environment factor) (Cheok & others, 2009; Keers & others, 2010). The goal of many pharmacogenetic studies is to discover if certain drugs are safer or more dangerous to use if the individual's genotype is known (Berlin, Paul, & Vesell, 2009; Lima & others, 2009).

CONCLUSIONS ABOUT HEREDITY-ENVIRONMENT INTERACTION

If an attractive, popular, intelligent girl is elected president of her senior class in high school, is her success due to heredity or to environment? Of course, the answer is both.

The relative contributions of heredity and environment are not additive. That is, we can't say that such-and-such a percentage of nature and such-and-such a

epigenetic view Emphasizes that development is the result of an ongoing, bidirectional interchange between heredity and environment.

gene × environment (G × E) interaction The interaction of a specific measured variation in the DNA and a specific measured aspect of the environment.

percentage of experience make us who we are. Nor is it accurate to say that full genetic expression happens once, around conception or birth, after which we carry our genetic legacy into the world to see how far it takes us. Genes produce proteins throughout the life span, in many different environments. Or they don't produce these proteins, depending in part on how harsh or nourishing those environments are.

The emerging view is that complex behaviors have some genetic loading that gives people a propensity for a particular developmental trajectory (Goldsmith, 2011). However, the actual development requires more: an environment. And that environment is complex, just like the mixture of genes we inherit (Duncan, Ziol-Guest, & Kalil, 2010; Gauvain & Parke, 2010). Environmental influences range from the things we lump together under "nurture" (such as parenting, family dynamics, schooling, and neighborhood quality) to biological encounters (such as viruses, birth complications, and even biological events in cells).

developmental **connection**

Nature vs. Nurture. The nature and nurture issue is one of the main debates in the study of life-span development. Chapter 1, p. 20

Imagine for a moment that there is a cluster of genes somehow associated with youth violence (this example is hypothetical because we don't know of any such combination). The adolescent who carries this genetic mixture might experience a world of loving parents, regular nutritious meals, lots of books, and a series of masterful teachers. Or the adolescent's world might include parental neglect, a neighborhood in which gunshots and crime are everyday occurrences, and inadequate schooling. In which of these environments are the adolescent's genes likely to manufacture the biological underpinnings of criminality?

developmental **connection**

Life-Span Perspective. An important aspect of the life-span perspective is the co-construction of biology, environment, and the individual. Chapter 1, p. 9

If heredity and environment interact to determine the course of development, is that all there is to answering the question of what causes development? Are humans completely at the mercy of their genes and environment as they develop through the life span? Our genetic heritage and environmental experiences are pervasive influences on development (Sameroff, 2010; Wermter & others, 2010). But in thinking about what causes development, recall from Chapter 1 our discussion of development as the co-construction of biology, culture, *and* the individual. We not only are the outcomes of our heredity and the environment we experience, but we also can author a unique developmental path by changing the environment. As one psychologist recently concluded:

> In reality, we are both the creatures and creators of our worlds. We are . . . the products of our genes and environments. Nevertheless, . . . the stream of causation that shapes the future runs through our present choices . . . Mind matters . . . Our hopes, goals, and expectations influence our future. (Myers, 2010, p. 168)

Review *Connect* Reflect

LG4 Explain some of the ways that heredity and environment interact to produce individual differences in development.

Review

- What is behavior genetics?
- What are three types of heredity-environment correlations?
- What is meant by the concepts of shared and nonshared environmental experiences?
- What is the epigenetic view of development? What characterizes gene × environment (G × E) interaction?
- What conclusions can be reached about heredity-environment interaction?

Connect

- Of passive, evocative, and active genotype-environment correlations, which is the best explanation for the similarities discovered between the twins discussed in the chapter-opening story?

Reflect *Your Own Personal Journey of Life*

- Someone tells you that she has analyzed your genetic background and environmental experiences and concluded that environment definitely has had little influence on your intelligence. What would you say about this analysis?

topical **connections**

In the following chapters, we will continue to explore biological influences on development, especially in the chapters on physical development, but also in the chapters on cognitive and socioemotional development. For instance, biology's influence on infants' gross and fine motor skills (Chapter 4) may be obvious, but we will also discuss such research questions as "Is there a biological basis for sexual orientation?" (Chapter 13). In addition, we will examine reproduction when we look at adolescents (Chapter 11) and young adults (Chapter 14) who become parents. Finally, we will touch on the dual influence of nature and nurture in every period of life-span development.

*looking **forward***

reach your **learning goals**

1 The Evolutionary Perspective

LG1 Discuss the evolutionary perspective on life-span development.

Natural Selection and Adaptive Behavior

- Natural selection is the process by which those individuals of a species that are best adapted survive and reproduce. Darwin proposed that natural selection fuels evolution. In evolutionary theory, adaptive behavior is behavior that promotes the organism's survival in a natural habitat.

Evolutionary Psychology

- Evolutionary psychology holds that adaptation, reproduction, and "survival of the fittest" are important in shaping behavior. Ideas proposed by evolutionary developmental psychology include the view that an extended childhood period is needed to develop a large brain and learn the complexity of human social communities. According to Baltes, the benefits resulting from evolutionary selection decrease with age mainly because of a decline in reproductive fitness. At the same time, cultural needs increase. Like other theoretical approaches to development, evolutionary psychology has limitations. Bandura rejects "one-sided evolutionism" and argues for a bidirectional link between biology and environment. Biology allows for a broad range of cultural possibilities.

2 Genetic Foundations of Development

LG2 Describe what genes are and how they influence human development.

The Collaborative Gene

- Short segments of DNA constitute genes, the units of hereditary information that direct cells to reproduce and manufacture proteins. Genes act collaboratively, not independently.

Genes and Chromosomes

- Genes are passed on to new cells when chromosomes are duplicated during the process of mitosis and meiosis, which are two ways in which new cells are formed. When an egg and a sperm unite in the fertilization process, the resulting zygote contains the genes from the chromosomes in the father's sperm and the mother's egg. Despite this transmission of genes from generation to generation, variability is created in several ways, including the exchange of chromosomal segments during meiosis, mutations, and the distinction between a genotype and a phenotype.

Genetic Principles

- Genetic principles include those involving dominant-recessive genes, sex-linked genes, genetic imprinting, and polygenic inheritance.

Chromosome and Gene-Linked Abnormalities

- Chromosome abnormalities produce Down syndrome, which is caused by the presence of an extra copy of chromosome 21, as well as sex-linked chromosomal abnormalities such as Klinefelter syndrome, fragile X syndrome, Turner syndrome, and XYY syndrome. Gene-linked abnormalities involve harmful genes. Gene-linked disorders include phenylketonuria (PKU) and sickle-cell anemia. Genetic counseling offers couples information about their risk of having a child with inherited abnormalities.

3 Reproductive Challenges and Choices

LG3 Identify some important reproductive challenges and choices.

Prenatal Diagnostic Tests

- Ultrasound sonography, fetal MRI, chorionic villus sampling, amniocentesis, and maternal blood screening are used to determine whether a fetus is developing normally. Noninvasive prenatal diagnosis is increasingly being explored.

Infertility and Reproductive Technology

- Approximately 10 to 15 percent of U.S. couples have infertility problems, some of which can be corrected through surgery or fertility drugs. An additional option is in vitro fertilization.

Adoption

- Although adopted children and adolescents have more problems than their nonadopted counterparts, the vast majority of adopted children adapt effectively. When adoption occurs very early in development, the outcomes for the child are improved. Because of the dramatic changes that occurred in adoption in recent decades, it is difficult to generalize about the average adopted child or average adoptive family.

4 Heredity and Environment Interaction:

LG4 The Nature-Nurture Debate: Explain some of the ways that heredity and environment interact to produce individual differences in development.

Behavior Genetics

- Behavior genetics is the field concerned with the influence of heredity and environment on individual differences in human traits and development. Methods used by behavior geneticists include twin studies and adoption studies.

Heredity-Environment Correlations

- In Scarr's heredity-environment correlations view, heredity directs the types of environments that children experience. She describes three genotype-environment correlations: passive, evocative, and active (niche-picking). Scarr argues that the relative importance of these three genotype-environment correlations changes as children develop.

Shared and Nonshared Environmental Experiences

- Shared environmental experiences refer to siblings' common experiences, such as their parents' personalities and intellectual orientation, the family's socioeconomic status, and the neighborhood in which they live. Nonshared environmental experiences involve the child's unique experiences, both within a family and outside a family, that are not shared with a sibling. Many behavior geneticists argue that differences in the development of siblings are due to nonshared environmental experiences (and heredity) rather than shared environmental experiences.

The Epigenetic View and Gene × Environment (G × E) Interaction

- The epigenetic view emphasizes that development is the result of an ongoing, bidirectional interchange between heredity and environment. Gene × environment interaction involves the interaction of a specific measured variation in the DNA and a specific measured aspect of the environment. An increasing number of G × E studies are being conducted.

L **Conclusions About Heredity-Environment Interaction**

- Complex behaviors have some genetic loading that gives people a propensity for a particular developmental trajectory. However, actual development also requires an environment, and that environment is complex. The interaction of heredity and environment is extensive. Much remains to be discovered about the specific ways that heredity and environment interact to influence development. Although heredity and environment are pervasive influences on development, humans can author a unique developmental path by changing the environment.

key **terms**

evolutionary psychology 55
chromosomes 58
DNA 58
genes 58
mitosis 59
meiosis 59
fertilization 59
zygote 59
genotype 60
phenotype 60
Down syndrome 62
Klinefelter syndrome 62
fragile X syndrome 62
Turner syndrome 63
XYY syndrome 63
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chapter 3

PRENATAL DEVELOPMENT AND BIRTH

chapter **outline**

1 Prenatal Development

Learning Goal 1 Describe prenatal development.

- The Course of Prenatal Development
- Teratology and Hazards to Prenatal Development
- Prenatal Care
- Normal Prenatal Development

2 Birth

Learning Goal 2 Describe the birth process.

- The Birth Process
- Assessing the Newborn
- Preterm and Low Birth Weight Infants

3 The Postpartum Period

Learning Goal 3 Explain the changes that take place in the postpartum period.

- Physical Adjustments
- Emotional and Psychological Adjustments
- Bonding

Diana and Roger married when he was 38 and she was 34. Both worked full-time and were excited when Diana became pregnant. Two months later, Diana began to have some unusual pains and bleeding. Just two months into her pregnancy she had lost the baby. Diana thought deeply about why she was unable to carry the baby to full term. It was about the time she became pregnant that the federal government began to warn that eating certain types of fish with a high mercury content during pregnancy on a regular basis can cause a miscarriage. Now she eliminated these fish from her diet.

Alex, also known as "Mr. Littles."

Six months later, Diana became pregnant again. She and Roger read about pregnancy and signed up for birth preparation classes. Each Friday night for eight weeks they practiced simulated contractions. They talked about what kind of parents they wanted to be and discussed what changes in their lives the baby would make. When they found out that their offspring was going to be a boy, they gave him a name: Mr. Littles.

This time, Diana's pregnancy went well, and Alex, also known as Mr. Littles, was born. During the birth, however, Diana's heart rate dropped precipitously, and she was given a stimulant to raise it. Apparently the stimulant also increased Alex's heart rate and breathing to a dangerous point, and he had to be placed in a neonatal intensive care unit (NICU).

Several times a day, Diana and Roger visited Alex in the NICU. A number of babies in the NICU who had a very low birth weight had been in intensive care for weeks, and some of these babies were not doing well. Fortunately, Alex was in better health. After several days in the NICU, his parents were permitted to take home a very healthy Alex.

topical **connections**

Genes form the biological basis of our development. They are passed on through mitosis, meiosis, and, ultimately, fertilization. The impact of our genes involves the genetic principles of dominate-recessive genes, sex-linked genes, genetic imprinting, and polygenically determined characteristics. Approximately 10–15 percent of U.S. couples have problems with fertility. Some of these problems can be solved through surgery, drugs, or in vitro fertilization. Whether a pregnancy occurs naturally or with assistance, the resulting infant's development is shaped both by his or her genes (nature) and environment (nurture).

*looking **back***

preview

This chapter chronicles the truly remarkable developments from conception through birth. Imagine . . . at one time you were an organism floating in a sea of fluid in your mother's womb. Let's now explore what your development was like from the time you were conceived through the time you were born. We will explore normal development in the prenatal period, as well as the period's hazards (such as high levels of mercury that were mentioned in the preceding story). We also will study the birth process and tests used to assess the newborn; discuss parents' adjustment in the postpartum period; and evaluate parent-infant bonding.

1 Prenatal Development

LG1 Describe prenatal development.

The Course of Prenatal Development

Teratology and Hazards to Prenatal Development

Prenatal Care

Normal Prenatal Development

Imagine how Alex ("Mr. Littles") came to be. Out of thousands of eggs and millions of sperm, one egg and one sperm united to produce him. Had the union of sperm and egg come a day or even an hour earlier or later, he might have been very different—maybe even of the opposite sex. *Conception* occurs when a single sperm cell from the male unites with an ovum (egg) in the female's fallopian tube in a process called fertilization. Over the next few months, the genetic code discussed in Chapter 2 directs a series of changes in the fertilized egg, but many events and hazards will influence how that egg develops and becomes tiny Alex.

THE COURSE OF PRENATAL DEVELOPMENT

Typical prenatal development begins with fertilization and ends with birth, lasting between 266 and 280 days (from 38 to 40 weeks). It can be divided into three periods: germinal, embryonic, and fetal.

The Germinal Period The **germinal period** is the period of prenatal development that takes place in the first two weeks after conception. It includes the creation of the fertilized egg, called a zygote, cell division, and the attachment of the zygote to the uterine wall.

Rapid cell division by the zygote continues throughout the germinal period (recall from Chapter 2 that this cell division occurs through a process called *mitosis*). By approximately one week after conception, the differentiation of these cells—their specialization for different tasks—has already begun. At this stage, the group of cells, now called the **blastocyst,** consists of an inner mass of cells that will eventually develop into the embryo, and the **trophoblast,** an outer layer of cells that later provides nutrition and support for the embryo. *Implantation,* the attachment of the zygote to the uterine wall, takes place about 11 to 15 days after conception. Figure 3.1 illustrates some of the most significant developments during the germinal period.

The Embryonic Period The **embryonic period** is the period of prenatal development that occurs from two to eight weeks after conception. During the embryonic period, the rate of cell differentiation intensifies, support systems for cells form, and organs appear.

This period begins as the blastocyst attaches to the uterine wall. The mass of cells is now called an *embryo,* and three layers of cells form. The embryo's *endoderm*

germinal period The period of prenatal development that takes place in the first two weeks after conception. It includes the creation of the zygote, continued cell division, and the attachment of the zygote to the uterine wall.

blastocyst The inner layer of cells that develops during the germinal period. These cells later develop into the embryo.

trophoblast The outer layer of cells that develops in the germinal period. These cells provide nutrition and support for the embryo.

embryonic period The period of prenatal development that occurs two to eight weeks after conception. During the embryonic period, the rate of cell differentiation intensifies, support systems for the cells form, and organs appear.

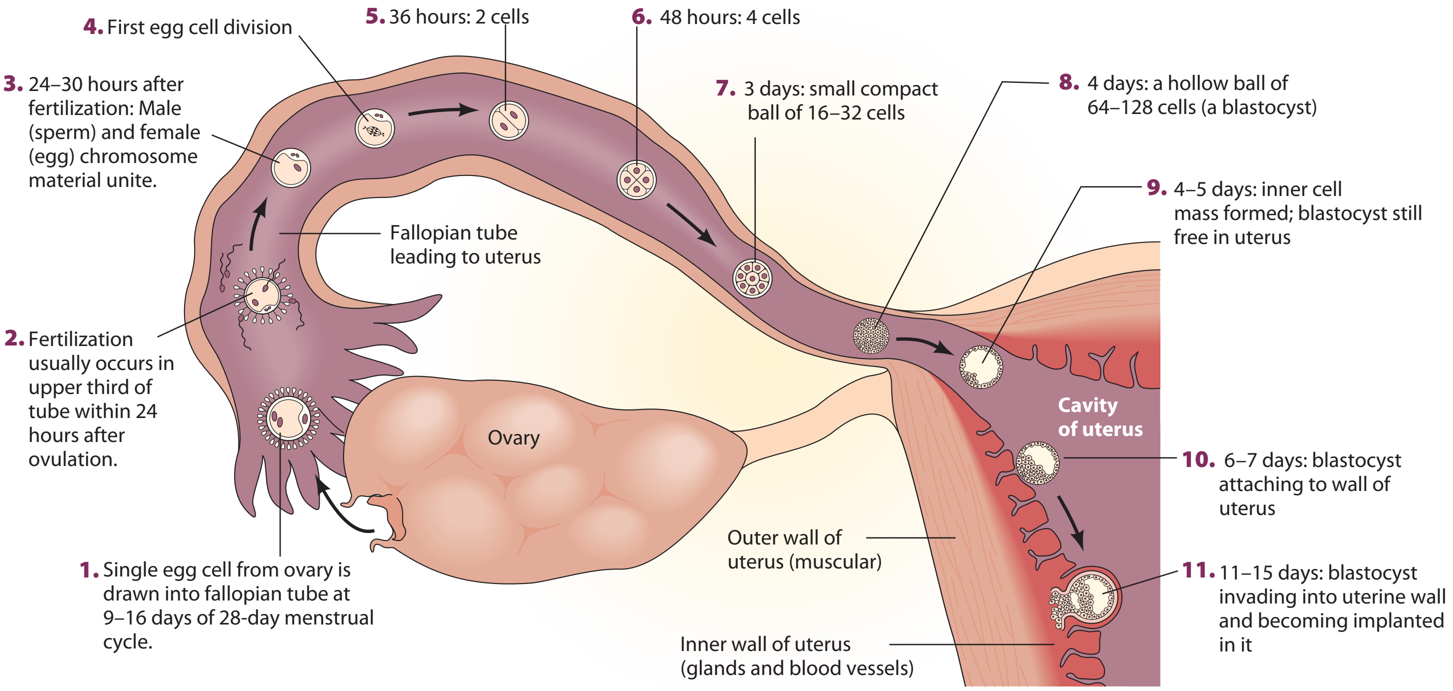

4. First egg cell division
5. 36 hours: 2 cells
6. 48 hours: 4 cells
3. 24–30 hours after fertilization: Male (sperm) and female (egg) chromosome material unite.
7. 3 days: small compact ball of 16–32 cells
8. 4 days: a hollow ball of 64–128 cells (a blastocyst)
9. 4–5 days: inner cell mass formed; blastocyst still free in uterus
Fallopian tube leading to uterus
2. Fertilization usually occurs in upper third of tube within 24 hours after ovulation.
Ovary
Cavity of uterus
10. 6–7 days: blastocyst attaching to wall of uterus
Outer wall of uterus (muscular)
1. Single egg cell from ovary is drawn into fallopian tube at 9–16 days of 28-day menstrual cycle.
11. 11–15 days: blastocyst invading into uterine wall and becoming implanted in it
Inner wall of uterus (glands and blood vessels)

FIGURE **3.1**

SIGNIFICANT DEVELOPMENTS IN THE GERMINAL PERIOD. Just one week after conception, cells of the blastocyst have already begun specializing. The germination period ends when the blastocyst attaches to the uterine wall. *Which of the steps shown in the drawing occur in the laboratory when IVF (described in Chapter 2) is used?*

is the inner layer of cells, which will develop into the digestive and respiratory systems. The *mesoderm* is the middle layer, which will become the circulatory system, bones, muscles, excretory system, and reproductive system. The *ectoderm* is the outermost layer, which will become the nervous system and brain, sensory receptors (ears, nose, and eyes, for example), and skin parts (hair and nails, for example). Every body part eventually develops from these three layers. The endoderm primarily produces internal body parts, the mesoderm primarily produces parts that surround the internal areas, and the ectoderm primarily produces surface parts.

As the embryo's three layers form, life-support systems for the embryo develop rapidly. These life-support systems include the amnion, the umbilical cord (both of which develop from the fertilized egg, not the mother's body), and the placenta. The **amnion** is like a bag or an envelope and contains a clear fluid in which the developing embryo floats. The amniotic fluid provides an environment that is temperature and humidity controlled, as well as shockproof. The **umbilical cord** contains two arteries and one vein, and connects the baby to the placenta. The **placenta** consists of a disk-shaped group of tissues in which small blood vessels from the mother and the offspring intertwine but do not join.

Figure 3.2 illustrates the placenta, the umbilical cord, and the blood flow in the expectant mother and developing organism. Very small molecules—oxygen, water, salt, food from the mother's blood, as well as carbon dioxide and digestive wastes from the offspring's blood—pass back and forth between the mother and embryo or fetus (Wick & others, 2010). Large molecules cannot pass through the placental wall; these include red blood cells and harmful substances, such as most bacteria and maternal wastes. The mechanisms that govern the transfer of substances across the placental barrier are complex and are still not entirely understood (Barta & Drugan, 2010).

By the time most women know they are pregnant, the major organs have begun to form. **Organogenesis** is the name given to the process of organ formation during the first two months of prenatal development. While they are being formed, the

amnion The life-support system that is a bag or envelope that contains a clear fluid in which the developing embryo floats.

umbilical cord A life-support system containing two arteries and one vein that connects the baby to the placenta.

placenta A life-support system that consists of a disk-shaped group of tissues in which small blood vessels from the mother and offspring intertwine.

organogenesis Organ formation that takes place during the first two months of prenatal development.

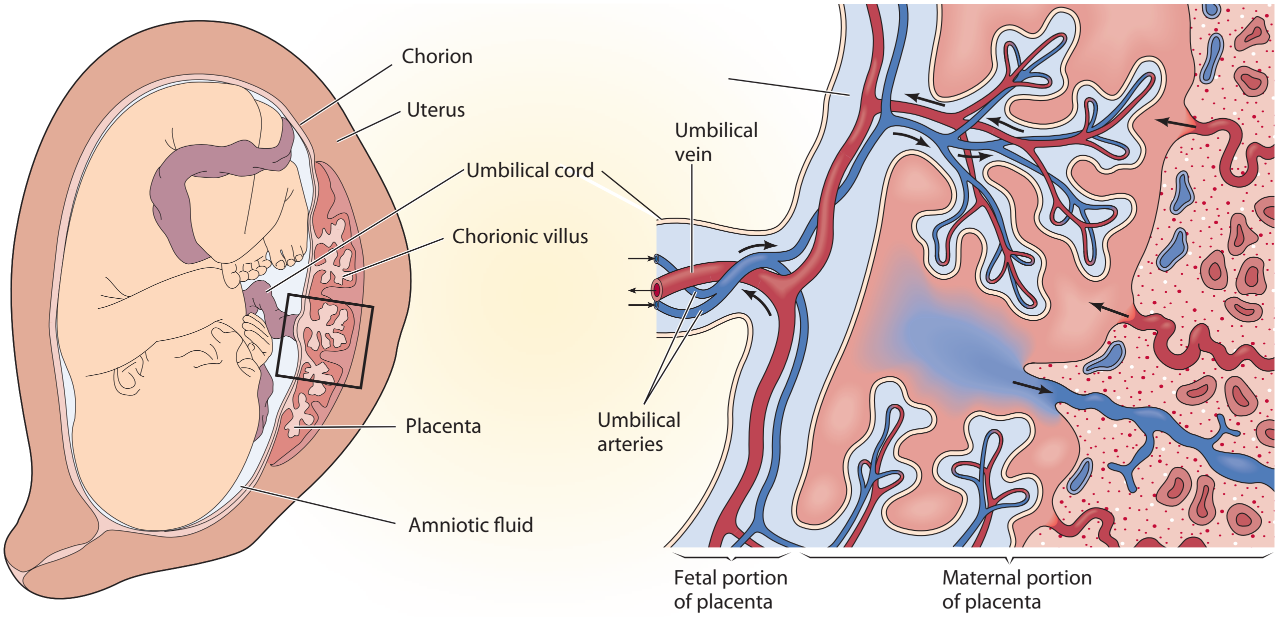


FIGURE **3.2**

THE PLACENTA AND THE UMBILICAL CORD. The area bound by the square is enlarged in the right half of the illustration. Arrows indicate the direction of blood flow. Maternal blood flows through the uterine arteries to the spaces housing the placenta, and it returns through the uterine veins to the maternal circulation. Fetal blood flows through the umbilical arteries into the capillaries of the placenta and returns through the umbilical vein to the fetal circulation. The exchange of materials takes place across the layer separating the maternal and fetal blood supplies, so the bloods never come into contact. *What is known about how the placental barrier works and its importance?*

organs are especially vulnerable to environmental changes (Rojas & others, 2010; Torchinsky & Toder, 2010). In the third week after conception, the neural tube that eventually becomes the spinal cord forms. At about 21 days, eyes begin to appear, and at 24 days the cells for the heart begin to differentiate. During the fourth week, the urogenital system becomes apparent, and arm and leg buds emerge. Four chambers of the heart take shape, and blood vessels appear. From the fifth to the eighth week, arms and legs differentiate further; at this time, the face starts to form but still is not very recognizable. The intestinal tract develops and the facial structures fuse. At eight weeks, the developing organism weighs about 1/30 ounce and is just over 1 inch long.

The Fetal Period The **fetal period,** lasting about seven months, is the prenatal period between two months after conception and birth in typical pregnancies. Growth and development continue their dramatic course during this time.

Three months after conception, the fetus is about 3 inches long and weighs about 3 ounces. It has become active, moving its arms and legs, opening and closing its mouth, and moving its head. The face, forehead, eyelids, nose, and chin are distinguishable, as are the upper arms, lower arms, hands, and lower limbs. In most cases, the genitals can be identified as male or female. By the end of the fourth month of pregnancy, the fetus has grown to 6 inches in length and weighs 4 to 7 ounces. At this time, a growth spurt occurs in the body's lower parts. For the first time, the mother can feel arm and leg movements.

By the end of the fifth month, the fetus is about 12 inches long and weighs close to a pound. Structures of the skin have formed—toenails and fingernails, for example. The fetus is more active, showing a preference for a particular position in the womb. By the end of the sixth month, the fetus is about 14 inches long and has gained another half pound to a pound. The eyes and eyelids are completely formed, and a fine layer of hair covers the head. A grasping reflex is present and irregular breathing movements occur.

> The history of man for nine months preceding his birth would probably, be far more interesting, and contain events of greater moment than all three score and ten years that follow it.
>
> —Samuel Taylor Coleridge
>
> *English Poet Essayist, 19th Century*

fetal period Lasting about seven months, the prenatal period between two months after conception and birth in typical pregnancies.

Prenatal Growth

First trimester (first 3 months)

Conception to 4 weeks
- Is less than $^{1}/_{10}$ inch long
- Beginning development of spinal cord, nervous system, gastrointestinal system, heart, and lungs
- Amniotic sac envelopes the preliminary tissues of entire body
- Is called a "zygote"

8 weeks
- Is just over 1 inch long
- Face is forming with rudimentary eyes, ears, mouth, and tooth buds
- Arms and legs are moving
- Brain is forming
- Fetal heartbeat is detectable with ultrasound
- Is called an "embryo"

12 weeks
- Is about 3 inches long and weighs about 1 ounce
- Can move arms, legs, fingers, and toes
- Fingerprints are present
- Can smile, frown, suck, and swallow
- Sex is distinguishable
- Can urinate
- Is called a "fetus"

Second trimester (middle 3 months)

16 weeks
- Is about 6 inches long and weighs about 4 to 7 ounces
- Heartbeat is strong
- Skin is thin, transparent
- Downy hair (lanugo) covers body
- Fingernails and toenails are forming
- Has coordinated movements; is able to roll over in amniotic fluid

20 weeks
- Is about 12 inches long and weighs close to 1 pound
- Heartbeat is audible with ordinary stethoscope
- Sucks thumb
- Hiccups
- Hair, eyelashes, eyebrows are present

24 weeks
- Is about 14 inches long and weighs 1 to $1^{1}/_{2}$ pounds
- Skin is wrinkled and covered with protective coating (vernix caseosa)
- Eyes are open
- Waste matter is collected in bowel
- Has strong grip

Third trimester (last 3 months)

28 weeks
- Is about 16 inches long and weighs about 3 pounds
- Is adding body fat
- Is very active
- Rudimentary breathing movements are present

32 weeks
- Is $16^{1}/_{2}$ to 18 inches long and weighs 4 to 5 pounds
- Has periods of sleep and wakefulness
- Responds to sounds
- May assume the birth position
- Bones of head are soft and flexible
- Iron is being stored in liver

36 to 38 weeks
- Is 19 to 20 inches long and weighs 6 to $7^{1}/_{2}$ pounds
- Skin is less wrinkled
- Vernix caseosa is thick
- Lanugo is mostly gone
- Is less active
- Is gaining immunities from mother

FIGURE **3.3**

THE THREE TRIMESTERS OF PRENATAL DEVELOPMENT. Both the germinal and embryonic periods occur during the first trimester. The end of the first trimester as well as the second and third trimesters are part of the fetal period.

As early as six months of pregnancy (about 24 to 25 weeks after conception), the fetus for the first time has a chance of surviving outside of the womb—that is, it is *viable.* Infants are born early, or between 24 and 37 weeks of pregnancy, usually need help breathing because their lungs are not yet fully mature. By the end of the seventh month, the fetus is about 16 inches long and now weighs about 3 pounds.

During the last two months of prenatal development, fatty tissues develop, and the functioning of various organ systems—heart and kidneys, for example—steps up. During the eighth and ninth months, the fetus grows longer and gains substantial weight—about another 4 pounds. At birth, the average American baby weighs 7½ pounds and is about 20 inches long.

Figure 3.3 gives an overview of the main events during prenatal development. Notice that instead of describing development in terms of germinal, embryonic, and fetal periods, Figure 3.3 divides prenatal development into equal periods of three months, called *trimesters.* Remember that the three trimesters are not the same as the three prenatal periods we have discussed. The germinal and embryonic periods occur in the first trimester. The fetal period begins toward the end of the first trimester and continues through the second and third trimesters. Viability (the chances of surviving outside the womb) occurs at the very end of the second trimester.

Yelyi Nordone, 12, of New York City, casts her line out into the pond during Camp Spifida at Camp Victory, near Millville, Pa., in July, 2008. Camp Spifida is a week-long residential camp for children with spina bifida.

The Brain One of the most remarkable aspects of the prenatal period is the development of the brain (Nelson, 2011). By the time babies are born, they have approximately 100 billion **neurons,** or nerve cells, which handle information processing at the cellular level in the brain. During prenatal development, neurons spend time moving to the right locations and are starting to become connected. The basic architecture of the human brain is assembled during the first two trimesters of prenatal development. In typical development, the third trimester of prenatal development and the first two years of postnatal life are characterized by connectivity and functioning of neurons (Moulson & Nelson, 2008).

As the human embryo develops inside its mother's womb, the nervous system begins forming as a long, hollow tube located on the embryo's back. This pear-shaped *neural tube*, which forms at about 18 to 24 days after conception, develops out of the ectoderm. The tube closes at the top and bottom ends at about 24 days after conception. Figure 3.4 shows that the nervous system still has a tubular appearance six weeks after conception.

Two birth defects related to a failure of the neural tube to close are anencephaly and spina bifida. The highest regions of the brain fail to develop when fetuses have anencephaly or when the head end of the neural tube fails to close, and they die in the womb, during childbirth, or shortly after birth (Levene & Chervenak, 2009). Spina bifida results in varying degrees of paralysis of the lower limbs. Individuals with spina bifida usually need assistive devices such as crutches, braces, or wheelchairs. Both maternal diabetes and obesity place the fetus at risk for developing neural tube defects (McQuire, Dyson, & Renfrew, 2010; Yazdy & others, 2010). A strategy that can help to prevent neural tube defects is for women to take adequate amounts of the B vitamin folic acid, a topic we will further discuss later in the chapter (Rasmussen & Clemmensen, 2010; Shookhoff & Ian Gallicano, 2010).

In a normal pregnancy, once the neural tube has closed, a massive proliferation of new immature **neurons** begins to takes place about the fifth prenatal week and continues throughout the remainder of the prenatal period. The generation of new neurons is called *neurogenesis* (Kronenberg & others, 2010). At the peak of neurogenesis, it is estimated that as many as 200,000 neurons are being generated every minute.

At approximately 6 to 24 weeks after conception, *neuronal migration* occurs (Nelson, 2011). This involves cells moving outward from their point of origin to their appropriate locations and creating the different levels, structures, and regions of the brain (Cozzi & others, 2010; Kuriyama & Mayor, 2009). Once a cell has migrated to its target destination, it must mature and develop a more complex structure.

At about the 23rd prenatal week, connections between neurons begin to occur, a process that continues postnatally (Moulson & Nelson, 2008). We will have much more to say about the structure of neurons, their connectivity, and the development of the infant brain in Chapter 4.

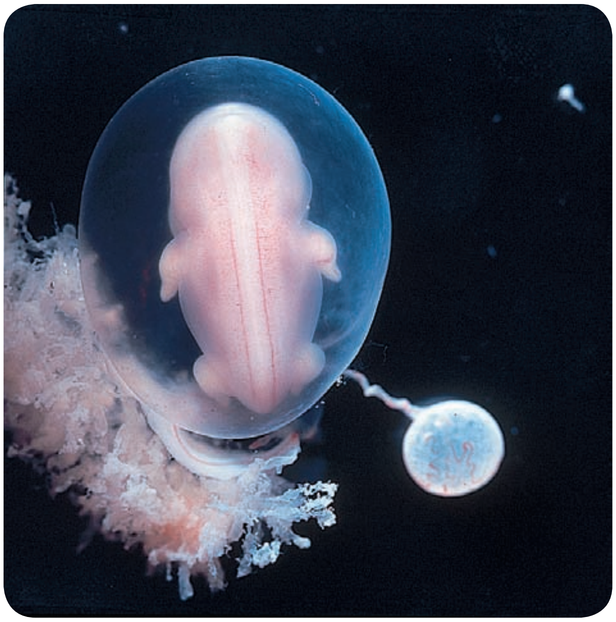


FIGURE **3.4**

EARLY FORMATION OF THE NERVOUS SYSTEM. The photograph shows the primitive, tubular appearance of the nervous system at six weeks in the human embryo.

developmental **connection**

Brain Development. At birth, infants' brains weigh approximately 25 percent of what they will when adulthood is reached. Chapter 4, p. 114

TERATOLOGY AND HAZARDS TO PRENATAL DEVELOPMENT

For Alex, the baby discussed at the opening of this chapter, the course of prenatal development went smoothly. His mother's womb protected him as he developed. Despite this protection, the environment can affect the embryo or fetus in many well-documented ways.

General Principles A **teratogen** is any agent that can potentially cause a birth defect or negatively alter cognitive and behavioral outcomes. (The word comes from the Greek word *tera,* meaning "monster.") So many teratogens exist that practically every fetus is exposed to at least some teratogens. For this reason, it is difficult to determine which teratogen causes which problem. In addition, it may take a long time for the effects of a teratogen to show up. Only about half of all potential effects appear at birth.

The field of study that investigates the causes of birth defects is called *teratology.* Some exposures to teratogens do not cause physical birth defects but can alter the developing brain and influence cognitive and behavioral functioning, in which case the field of study is called *behavioral teratology*.

The dose, genetic susceptibility, and the time of exposure to a particular teratogen influence both the severity of the damage to an embryo or fetus and the type of defect:

- ***Dose.*** The dose effect is rather obvious—the greater the dose of an agent, such as a drug, the greater the effect.
- ***Genetic susceptibility.*** The type or severity of abnormalities caused by a teratogen is linked to the genotype of the pregnant woman and the genotype of the embryo or fetus (Lidral & Murray, 2005). For example, how a mother metabolizes a particular drug can influence the degree to which the drug effects are transmitted to the embryo or fetus. The extent to which an embryo or fetus is vulnerable to a teratogen may also depend on its genotype (Marinucci & others, 2009). Also, for unknown reasons, male fetuses are far more likely to be affected by teratogens than female fetuses.
- ***Time of exposure.*** Teratogens do more damage when they occur at some points in development than at others (Weiner & Buhimschi, 2009). Damage during the germinal period may even prevent implantation. In general, the embryonic period is more vulnerable than the fetal period.

Figure 3.5 on the next page summarizes additional information about the effects of time of exposure to a teratogen. The probability of a structural defect is greatest early in the embryonic period, when organs are being formed (Hill, 2007). Each body structure has its own critical period of formation. Recall from Chapter 1 that a *critical period* is a fixed time period very early in development during which certain experiences or events can have a long-lasting effect on development. The critical period for the nervous system (week 3) is earlier than for arms and legs (weeks 4 and 5).

After organogenesis is complete, teratogens are less likely to cause anatomical defects. Instead, exposure during the fetal period is more likely instead to stunt growth or to create problems in the way organs function. To examine some key teratogens and their effects, let's begin with drugs.

Prescription and Nonprescription Drugs Many U.S. women are given prescriptions for drugs while they are pregnant—especially antibiotics, analgesics, and asthma medications. Prescription as well as nonprescription drugs, however, may have effects on the embryo or fetus that the women never imagine (Weiner & Buhimschi, 2009).

Prescription drugs that can function as teratogens include antibiotics, such as streptomycin and tetracycline; some antidepressants; certain hormones, such as progestin and synthetic estrogen; and Accutane (which often is prescribed for acne) (Bayraktar & others, 2010; Teichert & others, 2010).

neurons Nerve cells, which handle information processing at the cellular level in the brain.

teratogen From the Greek word *tera*, meaning "monster." Any agent that causes a birth defect. The field of study that investigates the causes of birth defects is called teratology.

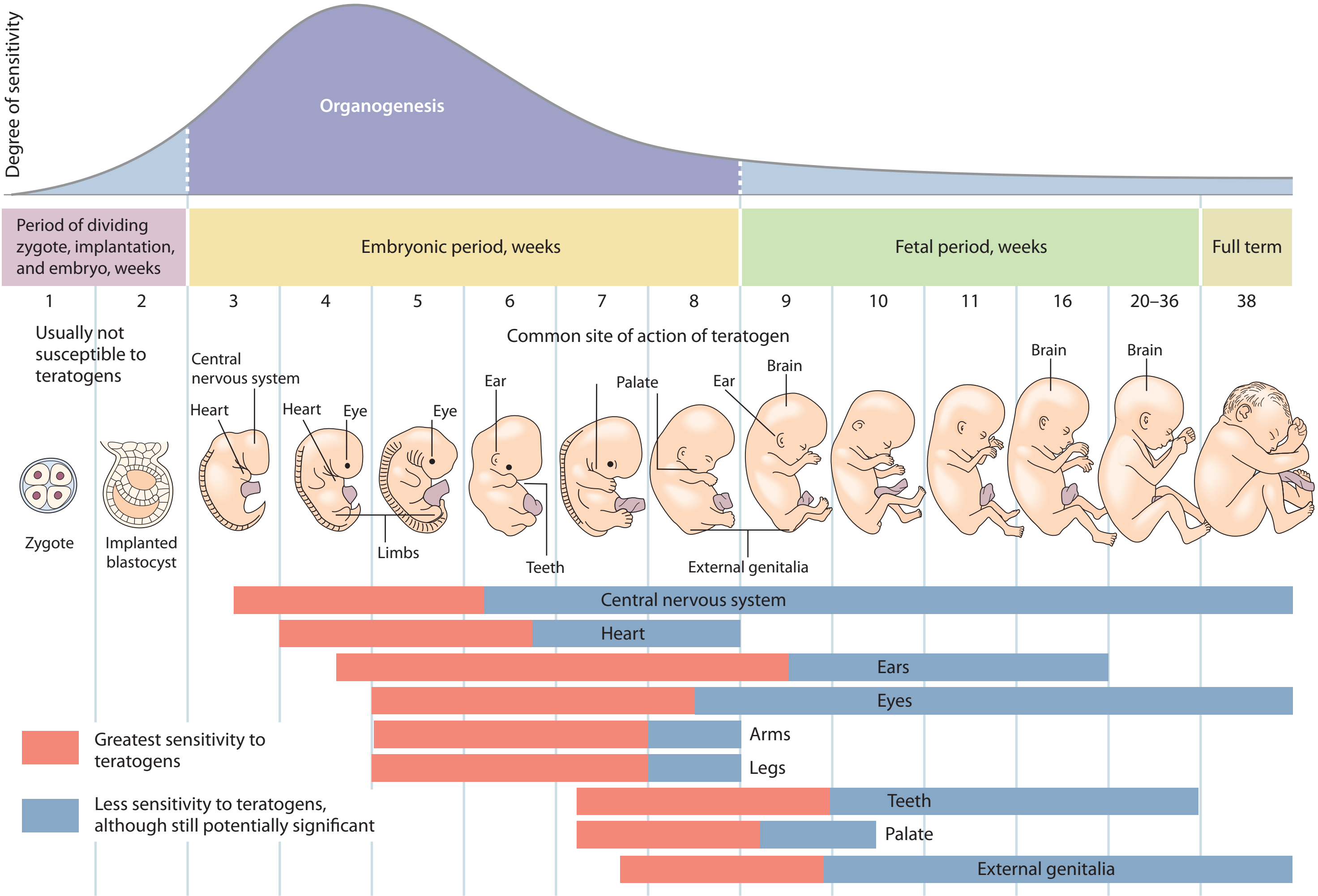
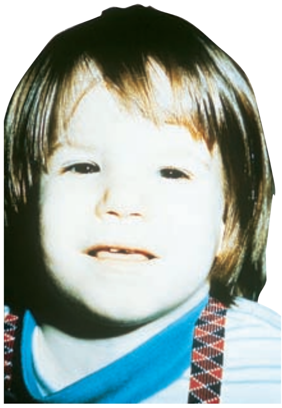


FIGURE **3.5**

TERATOGENS AND THE TIMING OF THEIR EFFECTS ON PRENATAL DEVELOPMENT. The danger of structural defects caused by teratogens is greatest early in embryonic development. The period of organogenesis (red color) lasts for about six weeks. Later assaults by teratogens (blue-green color) mainly occur in the fetal period and instead of causing structural damage are more likely to stunt growth or cause problems of organ function.

Antidepressant use by pregnant women has been extensively studied (Pedersen & others, 2009; Reis & Kallen, 2010; Simoncelli, Martin, & Berard, 2010). A recent study revealed that the offspring of pregnant women who redeemed prescriptions for more than one type of SSRIs (selective serotonin reuptake inhibitors) early in pregnancy had an increased risk of heart defects (Pedersen & others, 2009). In this study, negative effects on children's heart functioning increased when their mothers took these two SSRIs early in pregnancy: sertraline and citalopram. However, a recent research review by the American Psychiatric Association and the American College of Obstetricians and Gynecologists indicated that although some studies have found negative outcomes for antidepressant use during pregnancy, failure to control for various factors that can influence birth outcomes, such as maternal illness or problematic health behaviors, make conclusions about a link between antidepressant use by pregnant women and birth outcomes difficult (Yonkers & others, 2009). Later in the chapter, we will further discuss depression during pregnancy.

Nonprescription drugs that can be harmful include diet pills and high dosages of aspirin (Norgard & others, 2006). However, recent studies indicated that low doses of aspirin pose no harm for the fetus but that high doses can contribute to maternal and fetal bleeding (James, Brancazio, & Price, 2008; Marret & others, 2010).



Fetal alcohol spectrum disorders (FASD) are characterized by a number of physical abnormalities and learning problems. Notice the wide-set eyes, flat cheekbones, and thin upper lip in this child with FASD.

Psychoactive Drugs *Psychoactive drugs* are drugs that act on the nervous system to alter states of consciousness, modify perceptions, and change moods. Examples include caffeine, alcohol, and nicotine, as well as illicit drugs such as cocaine, methamphetamine, marijuana, and heroin.

Caffeine People often consume caffeine by drinking coffee, tea, or colas, or by eating chocolate. A recent study revealed that pregnant women who consumed 200 or more milligrams of caffeine a day had an increased risk of miscarriage (Weng, Odouli, & Li, 2008). Taking into account such results, the Food and Drug Administration recommends that pregnant women either not consume caffeine or consume it only sparingly.

Alcohol Heavy drinking by pregnant women can be devastating to offspring. **Fetal alcohol spectrum disorders (FASD)** are a cluster of abnormalities and problems that appear in the offspring of mothers who drink alcohol heavily during pregnancy. The abnormalities include facial deformities and defective limbs, face, and heart (Klingenberg & others, 2010). Most children with FASD have learning problems and many are below average in intelligence with some that are mentally retarded (Dalen & others, 2009). Recent studies revealed that children and adults with FASD have impaired memory development (Coles & others, 2010; Pei & others, 2008). Another recent study found that children with FASD have impaired math ability linked to multiple regions of the brain (Lebel & others, 2010). Although many mothers of FASD infants are heavy drinkers, many mothers who are heavy drinkers do not have children with FASD or have one child with FASD and other children who do not have it.

What are some guidelines for alcohol use during pregnancy? Even drinking just one or two servings of beer or wine or one serving of hard liquor a few days a week can have negative effects on the fetus, although it is generally agreed that this level of alcohol use will not cause fetal alcohol syndrome. The U.S. Surgeon General recommends that *no* alcohol be consumed during pregnancy. And research suggests that it may not be wise to consume alcohol at the time of conception. One study revealed that intakes of alcohol by both men and women during the weeks of conception increased the risk of early pregnancy loss (Henriksen & others, 2004).

Nicotine Cigarette smoking by pregnant women can also adversely influence prenatal development, birth, and postnatal development (Blood-Siegfried & Rende, 2010). Preterm births and low birth weights, fetal and neonatal deaths, respiratory problems, sudden infant death syndrome (SIDS, also known as crib death), and cardiovascular problems are all more common among the offspring of mothers who smoked during pregnancy (Feng & others, 2010; Landau, 2008; Lazic & others, 2010). Maternal smoking during pregnancy also has been identified as a risk factor for the development of attention deficit hyperactivity disorder in offspring (Knopik, 2009; Pinkhardt & others, 2009). A recent research review also indicated that environmental tobacco smoke was linked to increased risk of low birth weight in offspring (Leonardi-Bee & others, 2008).

Cocaine Does cocaine use during pregnancy harm the developing embryo and fetus? The most consistent finding is that cocaine exposure during prenatal development is associated with reduced birth weight, length, and head circumference (Smith & others, 2001). Also, in other studies, prenatal cocaine exposure has been linked to lower arousal, less effective self-regulation, higher excitability, and lower quality of reflexes at 1 month of age (Lester & others, 2002); to impaired motor development at 2 years of age and a slower rate of growth through 10 years of age (Richardson, Goldschmidt, & Willford, 2008); to deficits in behavioral self-regulation (Ackerman, Riggins, & Black, 2010); to impaired language development and information processing (Beeghly & others, 2006), including attention deficits (especially in sustained attention) in preschool and elementary schoolchildren (Accornero & others, 2006; Ackerman, Riggins, &

What are some links between expectant mothers' cigarette smoking and caffeine intake to outcomes for their offspring?

fetal alcohol spectrum disorders (FASD) A cluster of abnormalities that appears in the offspring of mothers who drink alcohol heavily during pregnancy.

Black, 2010); and to increased likelihood of being in a special education program that involves support services (Levine & others, 2008).

Some researchers argue that these findings should be interpreted cautiously (Accornero & others, 2006). Why? Because other factors in the lives of pregnant women who use cocaine (such as poverty, malnutrition, and other substance abuse) often cannot be ruled out as possible contributors to the problems found in their children (Hurt & others, 2005). For example, cocaine users are more likely than nonusers to smoke cigarettes, use marijuana, drink alcohol, and take amphetamines.

Despite these cautions, the weight of research evidence indicates that children born to mothers who use cocaine are likely to have neurological, medical, and cognitive deficits (Field, 2007; Mayer & Zhang, 2009). Cocaine use by pregnant women is never recommended.

This baby was exposed to cocaine prenatally. *What are some of the possible effects on development of being exposed to cocaine prenatally?*

Methamphetamine Methamphetamine, like cocaine, is a stimulant, speeding up an individual's nervous system. Babies born to mothers who use methamphetamine, or "meth," during pregnancy are at risk for a number of problems, including high infant mortality, low birth weight, and developmental and behavioral problems (Forester & Merz, 2007). A recent study also found memory deficits in children whose mothers used methamphetamine during pregnancy (Lu & others, 2009).

Marijuana An increasing number of studies find that marijuana use by pregnant women also has negative outcomes for offspring. For example, a recent study found that prenatal marijuana exposure was related to lower intelligence in children (Goldschmidt & others, 2008). Another study indicated that prenatal exposure to marijuana was linked to marijuana use at 14 years of age (Day, Goldschmidt, & Thomas, 2006). In sum, marijuana use is not recommended for pregnant women.

Heroin It is well documented that infants whose mothers are addicted to heroin show several behavioral difficulties at birth (Steinhausen, Blattmann, & Pfund, 2007). The difficulties include withdrawal symptoms, such as tremors, irritability, abnormal crying, disturbed sleep, and impaired motor control. Many still show behavioral problems at their first birthday, and attention deficits may appear later in development. The most common treatment for heroin addiction, methadone, is associated with very severe withdrawal symptoms in newborns (Binder & Vavrinkova, 2008).

Incompatible Blood Types Incompatibility between the mother's and father's blood types poses another risk to prenatal development. Blood types are created by differences in the surface structure of red blood cells. One type of difference in the surface of red blood cells creates the familiar blood groups—A, B, O, and AB. A second difference creates what is called Rh-positive and Rh-negative blood. If a surface marker, called the *Rh-factor,* is present in an individual's red blood cells, the person is said to be Rh-positive; if the Rh-marker is not present, the person is said to be Rh-negative. If a pregnant woman is Rh-negative and her partner is Rh-positive, the fetus may be Rh-positive. If the fetus' blood is Rh-positive and the mother's is Rh-negative, the mother's immune system may produce antibodies that will attack the fetus. This can result in any number of problems, including miscarriage or stillbirth, anemia, jaundice, heart defects, brain damage, or death soon after birth (Moise, 2005).

Generally, the first Rh-positive baby of an Rh-negative mother is not at risk, but with each subsequent pregnancy the risk increases. A vaccine (RhoGAM) may be given to the mother within three days of the first child's birth to prevent her body from making antibodies that will attack any future Rh-positive fetuses in subsequent pregnancies. Also, babies affected by Rh incompatibility can be given blood transfusions before or right after birth (Flegal, 2007).

An explosion at the Chernobyl nuclear power plant in the Ukraine produced radioactive contamination that spread to surrounding areas. Thousands of infants were born with health problems and deformities as a result of the nuclear contamination, including this boy whose arm did not form. *Other than radioactive contamination, what are some other types of environmental hazards to prenatal development?*

Environmental Hazards Many aspects of our modern industrial world can endanger the embryo or fetus. Some specific hazards to the embryo or fetus include radiation, toxic wastes, and other chemical pollutants (O'Connor & Roy, 2008).

X-ray radiation can affect the developing embryo or fetus, especially in the first several weeks after conception, when women do not yet know they are pregnant (Urbano & Tait, 2004). Women and their physicians should weigh the risk of an X-ray when an actual or potential pregnancy is involved (Baysinger, 2010; Menias & others, 2007). However, a routine diagnostic X-ray of a body area other than the abdomen, with the woman's abdomen protected by a lead apron, is generally considered safe (Brent, 2009).

Environmental pollutants and toxic wastes are also sources of danger to unborn children. Among the dangerous pollutants are carbon monoxide, mercury, and lead, as well as certain fertilizers and pesticides.

Maternal Diseases Maternal diseases and infections can produce defects in offspring by crossing the placental barrier, or they can cause damage during birth. Rubella (German measles) is one disease that can cause prenatal defects. Women who plan to have children should have a blood test before they become pregnant to determine if they are immune to the disease (Coonrod & others, 2008).

Syphilis (a sexually transmitted infection) is more damaging later in prenatal development—four months or more after conception. Damage includes eye lesions, which can cause blindness, and skin lesions.

Another infection that has received widespread attention is genital herpes. Newborns contract this virus when they are delivered through the birth canal of a mother with genital herpes (Hollier & Wendel, 2008). About one-third of babies delivered through an infected birth canal die; another one-fourth become brain damaged. If an active case of genital herpes is detected in a pregnant woman close to her delivery date, a cesarean section can be performed (in which the infant is delivered through an incision in the mother's abdomen) to keep the virus from infecting the newborn (Sellner & others, 2009).

AIDS is a sexually transmitted infection that is caused by the human immunodeficiency virus (HIV), which destroys the body's immune system. A mother can infect her offspring with HIV/AIDS in three ways: (1) during gestation across the placenta, (2) during delivery through contact with maternal blood or fluids, and (3) postpartum (after birth) through breast feeding. The transmission of AIDS through breast feeding is especially a problem in many developing countries (UNICEF, 2010). Babies born to HIV-infected mothers can be (1) infected and symptomatic (show HIV symptoms), (2) infected but asymptomatic (not show HIV symptoms), or (3) not infected at all. An infant who is infected and asymptomatic may still develop HIV symptoms up until 15 months of age.

The more widespread disease of diabetes, characterized by high levels of sugar in the blood, also affects offspring (Huda, Brodie, & Sattar, 2010; Oostdam & others, 2009). A recent large-scale study revealed that from 1999 to 2005 twice as many women and five times as many adolescents giving birth had diabetes (Lawrence & others, 2008).

A research review indicated that when newborns have physical defects they are more likely to have diabetic mothers (Eriksson, 2009). Women who have gestational diabetes also may deliver very large infants (weighing 10 pounds or more), and the infants are at risk for diabetes themselves (Gluck & others, 2009).

developmental **connection**

Conditions, Diseases, and Disorders. The greatest incidence of HIV/AIDS is in sub-Saharan Africa, where as many as 30 percent of mothers have HIV; many are unaware that they are infected with the virus. Chapter 4, p. 112

Other Parental Factors So far we have discussed a number of drugs, environmental hazards, maternal diseases, and incompatible blood types that can harm the embryo or fetus. Here we will explore other characteristics of the mother and father that can affect prenatal and child development, including nutrition, age, and emotional states and stress.

Maternal Diet and Nutrition A developing embryo or fetus depends completely on its mother for nutrition, which comes from the mother's blood (Shapira, 2008). The nutritional status of the embryo or fetus is determined by the mother's total caloric intake, and her intake of proteins, vitamins, and minerals. Children born to malnourished mothers are more likely than other children to be malformed.

Being overweight before and during pregnancy can also put the embryo or fetus at risk, and an increasing number of pregnant women in the United States are overweight (Griffiths & others, 2010; Sullivan & others, 2010). A recent research review concluded that obesity during pregnancy is linked to increased maternal risks of infertility, hypertensive disorders, diabetes, and delivery by cesarean section (Arendas, Qui, & Gruslin, 2008). In this review, obesity during pregnancy included these increased risks to the fetus: macrosomia (newborn with excessive birth weight), intrauterine fetal death, stillbirth, and admission to the neonatal intensive care unit (NICU).

One aspect of maternal nutrition that is important for normal prenatal development is folic acid, a B-complex vitamin (Rasmussen & Clemmensen, 2010). A recent study of more than 34,000 women taking folic acid either alone or as part of a multivitamin for at least one year prior to conceiving was linked with a 70 percent lower risk of delivering from 20 to 28 weeks and a 50 percent lower risk of delivering between 28 to 32 weeks (Bukowski & others, 2008). Another recent study revealed that toddlers of mothers who did not use folic acid supplements in the first trimester of pregnancy had more behavior problems (Roza & others, 2010). Also, we indicated earlier in the chapter, a lack of folic acid is related to neural tube defects in offspring, such as spina bifida (a defect in the spinal cord) (Shookhoff & Ian Gallicano, 2010). The U.S. Department of Health and Human Services (2009) recommends that pregnant women consume a minimum of 400 micrograms of folic acid per day (about twice the amount the average woman gets in one day). Orange juice and spinach are examples of foods rich in folic acid.

Because the fetus depends entirely on its mother for nutrition, it is important for the pregnant woman to have good nutritional habits. In Kenya, this government clinic provides pregnant women with information about how their diet can influence the health of their fetus and offspring. *What might the information about diet be like?*

Eating fish is often recommended as part of a healthy diet, but pollution has made many fish a risky choice for pregnant women. Some fish contain high levels of mercury, which is released into the air both naturally and by industrial pollution (Genuis, 2009). When mercury falls into the water it can become toxic and accumulate in large fish, such as shark, swordfish, king mackerel, and some species of large tuna (Mayo Clinic, 2009; Ramon & others, 2009). Mercury is easily transferred across the placenta, and the embryo's developing brain and nervous system are highly sensitive to the metal (Gliori & others, 2006). Researchers have found that prenatal mercury exposure is linked to adverse outcomes, including miscarriage, preterm birth, and lower intelligence (Triche & Hossain, 2007; Xue & others, 2007).

developmental **connection**

Conditions, Diseases, and Disorders. What are some key factors that influence whether individuals will become obese or not? Chapter 13, p. 421

Maternal Age When possible harmful effects on the fetus and infant are considered, two maternal ages are of special interest: (1) adolescence, and (2) 35 years and older (Malizia, Hacker, & Penzias, 2009). The mortality rate of infants born to adolescent mothers is double that of infants born to mothers in their twenties. Adequate prenatal care decreases the probability that a child born to an adolescent girl will have physical problems. However, adolescents are the least likely of women in all age groups to obtain prenatal assistance from clinics and health services.

Maternal age is also linked to the risk that a child will have Down syndrome (Allen & others, 2009; Ghosh & others, 2010). As discussed in Chapter 2, an individual

developmental **connection**

Parenting. Adolescent pregnancy creates negative developmental trajectories for both mothers and their offspring. Chapter 11, p. 361

with *Down syndrome* has distinctive facial characteristics, short limbs, and retardation of motor and mental abilities. A baby with Down syndrome rarely is born to a mother 16 to 34 years of age. However, when the mother reaches 40 years of age, the probability is slightly over 1 in 100 that a baby born to her will have Down syndrome, and by age 50 it is almost 1 in 10. When mothers are 35 years and older, risks also increase for low birth weight, for preterm delivery, and for fetal death (Mbugua & others, 2009).

We still have much to learn about the role of the mother's age in pregnancy and childbirth. As women remain active, exercise regularly, and are careful about their nutrition, their reproductive systems may remain healthier at older ages than was thought possible in the past.

What are some of the risks for infants born to adolescent mothers?

Emotional States and Stress When a pregnant woman experiences intense fears, anxieties, and other emotions or negative mood states, physiological changes occur that may affect her fetus (Entringer & others, 2009; Leung & others, 2010). A mother's stress may also influence the fetus indirectly by increasing the likelihood that the mother will engage in unhealthy behaviors, such as taking drugs and engaging in poor prenatal care.

High maternal anxiety and stress during pregnancy can have long-term consequences for the offspring. A recent research review indicated that pregnant women with high levels of stress are at increased risk for having a child with emotional or cognitive problems, attention deficit hyperactivity disorder (ADHD), and language delay (Taige & others, 2007).

Might maternal depression also have an adverse effect on prenatal development and birth? A recent study revealed maternal depression was linked to preterm birth and slower prenatal growth rates (Diego & others, 2009). In this study, mothers who were depressed had elevated cortisol levels, which likely contributed to the negative outcomes for the fetus and newborn.

Paternal Factors So far, we have discussed how characteristics of the mother—such as drug use, disease, diet and nutrition, age, and emotional states—can influence prenatal development and the development of the child. Might there also be some paternal risk factors? Indeed, there are several. Men's exposure to lead, radiation, certain pesticides, and petrochemicals may cause abnormalities in sperm that lead to miscarriage or diseases, such as childhood cancer (Cordier, 2008). The father's smoking during the mother's pregnancy also can cause problems for the offspring. In one study, heavy paternal smoking was associated with the risk of early pregnancy loss (Venners & others, 2003). This negative outcome may be related to secondhand smoke.

How do pregnant women's emotional states and stress affect prenatal development and birth?

PRENATAL CARE

Although prenatal care varies enormously, it usually involves a defined schedule of visits for medical care, which typically includes screening for manageable conditions and treatable diseases that can affect the baby or the mother (Lu & Lu, 2008). In addition to medical care, prenatal programs often include comprehensive educational, social, and nutritional services.

Does prenatal care matter? Information about pregnancy, labor, delivery, and caring for the newborn can be especially valuable for first-time mothers (Lowdermilk, Perry, & Cashion, 2011; Murray & McKinney, 2010). Prenatal care is also very important for women in poverty because it links them with other social services (Mattson & Smith, 2011; Perry & others, 2010).

An innovative program that is rapidly expanding in the United States is CenteringPregnancy (Steming, 2008). This program is relationship-centered and provides complete prenatal care in a group setting. CenteringPregnancy replaces traditional 15-minute physician visits with 90-minute peer group support settings and self-examination led by a physician or certified nurse-midwife. Groups of up to 10 women (and often their partners) meet regularly beginning at 12 to 16 weeks of pregnancy. The sessions emphasize empowering women to play an active role in experiencing a positive pregnancy. A recent study revealed that CenteringPregnancy groups made more prenatal visits, had higher breast feeding rates, and were more satisfied with their prenatal care than women in individual care (Klima & others, 2009).

Some prenatal programs for parents focus on home visitation (Eckenrode & others, 2010; Lee & others, 2009). Research evaluations indicate that the Nurse Family Partnership created by David Olds and his colleagues (2004, 2007) is successful. The Nurse Family Partnership involves home visits by trained nurses beginning in the second or third trimester of prenatal development. The extensive program consists of approximately 50 home visits from the prenatal period through two years of age. The home visits focus on the mother's health, access to health care, parenting, and improvement of the mother's life by providing her guidance in education, work, and relationships. Research revealed that the Nurse Family Partnership has numerous positive outcomes including fewer pregnancies, better work circumstances, and stability in relationship partners for the mother, and improved academic success and social development for the child (Olds & others, 2004, 2007). In another home visitation program, high-risk pregnant women and adolescents, many living in poverty conditions, were provided bi-weekly home visitation services that encouraged healthy prenatal behavior, social support, and links to medical and other community services (Lee & others, 2009). Compared to a control group of pregnant women and adolescents who did not receive the home visits, the home visitation group gave birth to fewer low birth weight infants.

In one study, in China, the longer fathers smoked, the greater the risk that their children would develop cancer (Ji & others, 1997). *What are some other paternal factors that can influence the development of the fetus and the child?*

A CenteringPregnancy program. This rapidly increasing program alters routine prenatal care by bringing women out of exam rooms and into relationship-oriented groups.

NORMAL PRENATAL DEVELOPMENT

Much of our discussion so far in this chapter has focused on what can go wrong with prenatal development. Prospective parents should take steps to avoid the vulnerabilities to fetal development that we have described. But it is important to keep in mind that most of the time, prenatal development does not go awry, and development occurs along the positive path that we described at the beginning of the chapter.

Review *Connect* Reflect

LG1 Describe prenatal development.

Review

- What is the course of prenatal development?
- What is teratology, and what are some of the main hazards to prenatal development?
- What are some good prenatal care strategies?
- Why is it important to take a positive approach to prenatal development?

Connect

- In Chapter 2, we discussed chromosomal and gene-linked abnormalities that can affect prenatal development. How are the symptoms of the related conditions or risks similar or different from those caused by teratogens or other hazards?

Reflect *Your Own Personal Journey of Life*

- If you are a woman, imagine that you have just found out that you are pregnant. What health-enhancing strategies will you follow through the prenatal period? For others, imagine that you are the partner of a woman who has just found out she is pregnant. What will be your role in increasing the likelihood that the prenatal period will go smoothly?

2 Birth

LG2 Describe the birth process.

The Birth Process

Assessing the Newborn

Preterm and Low Birth Weight Infants

Nature writes the basic script for how birth occurs, but parents make important choices about conditions surrounding birth. We look first at the sequence of physical steps when a child is born.

THE BIRTH PROCESS

The birth process occurs in stages, occurs in different contexts, and in most cases involves one or more attendants.

After the long journey of prenatal development, birth takes place. During birth the baby is on a threshold between two worlds. *What is the fetus/newborn transition like?*

Stages of Birth

The birth process occurs in three stages. The first stage is the longest of the three stages. Uterine contractions are 15 to 20 minutes apart at the beginning and last up to a minute. These contractions cause the woman's cervix to stretch and open. As the first stage progresses, the contractions come closer together, appearing every two to five minutes. Their intensity increases. By the end of the first birth stage, contractions dilate the cervix to an opening of about 10 centimeters (4 inches), so that the baby can move from the uterus to the birth canal. For a woman having her first child, the first stage lasts an average of 6 to 12 hours; for subsequent children, this stage typically is much shorter.

The second birth stage begins when the baby's head starts to move through the cervix and the birth canal. It terminates when the baby completely emerges from the mother's body. With each contraction, the mother bears down hard to push the baby out of her body. By the time the baby's head is out of the mother's body, the contractions come almost every minute and last for about a minute. This stage typically lasts approximately 45 minutes to an hour.

Afterbirth is the third stage, at which time the placenta, umbilical cord, and other membranes are detached and expelled. This final stage is the shortest of the three birth stages, lasting only minutes.

Childbirth Setting and Attendants

In the United States, 99 percent of births take place in hospitals, a figure that has remained constant for several decades (Martin & others, 2005). Who helps a mother during birth varies across cultures. In U.S. hospitals, it has become the norm for fathers or birth coaches to be with the mother throughout labor and delivery. In the East African Nigoni culture, men are completely excluded from the childbirth process. When a woman is ready to give birth, female relatives move into the woman's hut and the husband leaves, taking his belongings (clothes, tools, weapons, and so on) with him. He is not permitted to return until after the baby is born. In some cultures, childbirth is an open, community affair. For example, in the Pukapukan culture in the Pacific Islands, women give birth in a shelter that is open for villagers to observe.

afterbirth The third stage of birth, when the placenta, umbilical cord, and other membranes are detached and expelled.

Midwives Midwifery is practiced in most countries throughout the world (Wickham, 2009). In Holland, more than 40 percent of babies are delivered by midwives rather than doctors. However, in 2003, 91 percent of U.S. births were attended by physicians, and only 8 percent of women who delivered babies were attended by a *midwife* (Martin & others, 2005). Nonetheless, the 8 percent figure in 2003 represents a substantial increase from less than 1 percent of U.S. women attended by a midwife in 1975 (Martin & others, 2005). Ninety-five percent of the midwives who delivered babies in the United States in 2003 were certified nurse-midwives.

Doulas In some countries, a doula attends a childbearing woman. *Doula* is a Greek word that means "a woman who helps." A **doula** is a caregiver who provides continuous physical, emotional, and educational support for the mother before, during, and after childbirth. Doulas remain with the parents throughout labor, assessing and responding to the mother's needs. Researchers have found positive effects when a doula is present at the birth of a child (Berghella, Baxter, & Chauhan, 2008).

In the United States, most doulas work as independent providers hired by the expectant parents. Doulas typically function as part of a "birthing team," serving as an adjunct to the midwife or the hospital's obstetric staff.

Methods of Childbirth

U.S. hospitals often allow the mother and her obstetrician a range of options regarding their method of delivery. Key choices involve the use of medication, whether to use any of a number of nonmedicated techniques to reduce pain, and when to have a cesarean delivery.

Medication Three basic kinds of drugs that are used for labor are analgesia, anesthesia, and oxytocin/pitocin.

Analgesia is used to relieve pain. Analgesics include tranquilizers, barbiturates, and narcotics (such as Demerol).

Anesthesia is used in late first-stage labor and during delivery to block sensation in an area of the body or to block consciousness. There is a trend toward not using general anesthesia, which blocks consciousness, in normal births because general anesthesia can be transmitted through the placenta to the fetus (Lieberman & others, 2005). An *epidural block* is regional anesthesia that numbs the woman's body from the waist down. Researchers are continuing to explore safer drug mixtures for use at lower doses to improve the effectiveness and safety of epidural anesthesia (Balaji, Dhillon, & Russell, 2009).

Oxytocin is a synthetic hormone that is used to stimulate contractions; pitocin is the most widely used oxytocin. The benefits and risks of oxytocin as a part of childbirth continues to be debated (Vasdev, 2008).

Predicting how a drug will affect an individual woman and her fetus is difficult (Lowdermilk, Perry, & Cashion, 2011). A particular drug might have only a minimal effect on one fetus yet have a much stronger effect on another. The drug's dosage also is a factor (Weiner & Buhimschi, 2009). Stronger doses of tranquilizers and narcotics given to decrease the mother's pain potentially have a more negative effect on the fetus than mild doses. It is important for the mother to assess her level of pain and have a voice in the decision of whether she should receive medication.

A doula assisting a birth. *What types of support do doulas provide?*

Natural and Prepared Childbirth For a brief time not long ago, the idea of avoiding all medication during childbirth gained favor in the United States. Instead, many women chose to reduce the pain of childbirth through techniques known as natural childbirth and prepared childbirth. Today, at least some medication is used in the typical childbirth, but elements of natural childbirth and prepared childbirth remain popular (Oates & Abraham, 2010).

Natural childbirth is the method that aims to reduce the mother's pain by decreasing her fear through education about childbirth and by teaching her and her partner to use breathing methods and relaxation techniques during delivery.

doula A caregiver who provides continuous physical, emotional, and educational support for the mother before, during, and after childbirth.

natural childbirth This method attempts to reduce the mother's pain by decreasing her fear through education about childbirth and relaxation techniques during delivery.

connecting with careers

Linda Pugh, Perinatal Nurse

Perinatal nurses work with childbearing women to support health and growth during the childbearing experience. Linda Pugh, Ph.D., R.N.C., is a perinatal nurse on the faculty at The Johns Hopkins University School of Nursing. She is certified as an inpatient obstetric nurse and specializes in the care of women during labor and delivery. She teaches undergraduate and graduate students, educated professional nurses, and conducts research. In addition, Pugh consults with hospitals and organizations about women's health issues and topics we discuss in this chapter.

Her research interests include nursing interventions with low-income breast feeding women, discovering ways to prevent and ameliorate fatigue during childbearing, and using breathing exercises during labor.

French obstetrician Ferdinand Lamaze developed a method similar to natural childbirth that is known as **prepared childbirth,** or the Lamaze method. It includes a special breathing technique to control pushing in the final stages of labor, as well as more detailed education about anatomy and physiology. The Lamaze method has become very popular in the United States. The pregnant woman's partner usually serves as a coach, who attends childbirth classes with her and helps her with her breathing and relaxation during delivery.

In sum, proponents of current prepared childbirth methods conclude that when information and support are provided, women *know* how to give birth. To read about one nurse whose research focuses on fatigue during childbearing and breathing exercises during labor, see *Connecting With Careers* profile. And to read about the increased variety of techniques now being used to reduce stress and control pain during labor, see *Connecting Development to Life*.

Cesarean Delivery Normally, the baby's head comes through the vagina first. But if the baby is in a **breech position,** the baby's buttocks are the first part to emerge from the vagina. In 1 of every 25 deliveries, the baby's head is still in the uterus when the rest of the body is out. Breech births can cause respiratory problems. As a result, if the baby is in a breech position, a surgical procedure known as a cesarean section, or a cesarean delivery, is usually performed. In a **cesarean delivery,** the baby is removed from the mother's uterus through an incision made in her abdomen (Lee, El-Sayed, & Gould, 2008). The benefits and risks of cesarean sections continue to be debated (Bangdiwala & others, 2010).

prepared childbirth Developed by French obstetrician Ferdinand Lamaze, this childbirth strategy is similar to natural childbirth but includes a special breathing technique to control pushing in the final stages of labor and a more detailed anatomy and physiology course.

breech position The baby's position in the uterus that causes the buttocks to be the first part to emerge from the vagina.

cesarean delivery The baby is removed from the mother's uterus through an incision made in her abdomen.

ASSESSING THE NEWBORN

Almost immediately after birth, after the baby and its parents have been introduced, a newborn is taken to be weighed, cleaned up, and tested for signs of developmental problems that might require urgent attention (Therrell & others,

connecting development to life

From Waterbirth to Music Therapy

The effort to reduce stress and control pain during labor has recently led to an increase in the use of some older and some newer nonmedicated techniques (Field, 2007; Kalder & others, 2010; Moleti, 2009; Simkin & Bolding, 2004). These include waterbirth, massage, acupuncture, hypnosis, and music therapy.

Waterbirth

Waterbirth involves giving birth in a tub of warm water. Some women go through labor in the water and get out for delivery, others remain in the water for delivery. The rationale for waterbirth is that the baby has been in an amniotic sac for many months and that delivery in a similar environment is likely to be less stressful for the baby and the mother (Meyer, Weible, & Woeber, 2010). Mothers get into the warm water when contractions become closer together and more intense. Getting into the water too soon can cause labor to slow or stop. Reviews of research have indicated mixed results for waterbirths (Clyett & Burns, 2009; Pinette, Wax, & Wilson, 2004; Thöni & Moroder, 2004). Waterbirth has been practiced more often in European countries such as Switzerland and Sweden in recent decades than in the United States but is increasingly being included in U.S. birth plans.

What characterizes the use of waterbirth in delivering a baby?

Massage

Massage is increasingly used as a procedure prior to and during delivery (Field, 2007; Kimber & others, 2008; Stager, 2009–2010). Researchers have found that massage can reduce pain and anxiety during labor (Chang, Chen, & Huang, 2006). A recent study revealed that massage therapy reduced pain in pregnant women and alleviated prenatal depression in both parents and improved their relationships (Field & others, 2008).

Acupuncture

Acupuncture, the insertion of very fine needles into specific locations in the body, is used as a standard procedure to reduce the pain of childbirth in China, although it only recently has begun to be used in the United States for this purpose (Moleti, 2009). One study revealed that acupuncture resulted in less time spent in labor and a reduction in the need for oxytocin to augment labor (Gaudernack, Forbord, & Hole, 2006).

Hypnosis

Hypnosis, the induction of a psychological state of altered attention and awareness in which the individual is unusually responsive to suggestions, is also increasingly being used during childbirth (Wilcox, 2010). Some studies have indicated positive effects of hypnosis for reducing pain during childbirth (Abbasi & others, 2009; Barabasz & Perez, 2007).

Music Therapy

Music therapy during childbirth, which involves the use of music to reduce stress and manage pain, is increasingly used (Tagore, 2009). More research is needed to determine its effectiveness (Laopaiboon & others, 2009).

What are some reasons that natural childbirth methods such as these might be chosen instead of medication?

2010). The **Apgar Scale** is widely used to assess the health of newborns at one and five minutes after birth. The Apgar Scale evaluates an infant's heart rate, respiratory effort, muscle tone, body color, and reflex irritability. An obstetrician or a nurse does the evaluation and gives the newborn a score, or reading, of 0, 1, or 2 on each of these five health signs (see Figure 3.6). A total score of 7 to

Apgar Scale A widely used method to assess the health of newborns at one and five minutes after birth. The Apgar Scale evaluates an infant's heart rate, respiratory effort, muscle tone, body color, and reflex irritability.

Score	0	1	2
Heart rate	Absent	Slow—less than 100 beats per minute	Fast—100–140 beats per minute
Respiratory effort	No breathing for more than one minute	Irregular and slow	Good breathing with normal crying
Muscle tone	Limp and flaccid	Weak, inactive, but some flexion of extremities	Strong, active motion
Body color	Blue and pale	Body pink, but extremities blue	Entire body pink
Reflex irritability	No response	Grimace	Coughing, sneezing and crying

FIGURE **3.6**

THE APGAR SCALE. A newborn's score on the Apgar Scale indicates whether the baby has urgent medical problems. *What are some trends in the Apgar scores of U.S. babies?*

> There was a star danced, and under that I was born.
>
> —William Shakespeare
>
> *English Playwright, 17th Century*

10 indicates that the newborn's condition is good. A score of 5 indicates there may be developmental difficulties. A score of 3 or below signals an emergency and indicates that the baby might not survive.

The Apgar Scale is especially good at assessing the newborn's ability to respond to the stress of delivery and the new environment (Reynolds, 2010). It also identifies high-risk infants who need resuscitation. For a more thorough assessment of the newborn, the Brazelton Neonatal Behavioral Assessment Scale or the Neonatal Intensive Care Unit Network Neurobehavioral Scale may be used.

The **Brazelton Neonatal Behavioral Assessment Scale (NBAS)** is typically performed within 24 to 36 hours after birth. It is also used as a sensitive index of neurological competence up to one month after birth for typical infants and as a measure in many studies of infant development (Mamtani, Patel, & Kulkarni, 2008). The NBAS assesses the newborn's neurological development, reflexes, and reactions to people and objects. Sixteen reflexes, such as sneezing, blinking, and rooting, are assessed, along with reactions to animate (such as a face and voice) and inanimate stimuli (such as a rattle) (We will have more to say about reflexes in Chapter 4, when we discuss motor development in infancy.)

An "offspring" of the NBAS, the **Neonatal Intensive Care Unit Network Neurobehavioral Scale (NNNS)** provides another assessment of the newborn's behavior, neurological and stress responses, and regulatory capacities (Brazelton, 2004; Lester, Tronick, & Brazelton, 2004). Whereas the NBAS was developed to assess normal, healthy, term infants, T. Berry Brazelton, along with Barry Lester and Edward Tronick, developed the NNNS to assess the "at-risk" infant. It is especially useful for evaluating preterm infants (although it may not be appropriate for those less than 30 weeks' gestational age) and substance-exposed infants (Boukydis & Lester, 2008). A recent NNNS assessment (at one month of age) of preterm infants who were exposed to substance abuse prenatally revealed that the NNNS predicted certain developmental outcomes, such as neurological difficulties, IQ, and school readiness at 4.5 years of age (Liu & others, 2010).

Brazelton Neonatal Behavioral Assessment Scale (NBAS) A measure that is used in the first month of life to assess the newborn's neurological development, reflexes, and reactions to people and objects.

Neonatal Intensive Care Unit Neurobehavioral Scale (NNNS) An "offspring" of the NBAS, the NNNS provides an assessment of the newborn's behavior, neurological and stress responses, and regulatory capacities.

low birth weight infants An infant that weighs less than 5½ pounds at birth.

preterm infants Those born before the completion of 37 weeks of gestation (the time between fertilization and birth).

small for date infants Also called small for gestational age infants, these infants' birth weights are below normal when the length of pregnancy is considered. Small for date infants may be preterm or full term.

PRETERM AND LOW BIRTH WEIGHT INFANTS

Different conditions that pose threats for newborns have been given different labels. We will examine these conditions and discuss interventions for improving outcomes of preterm infants.

A "kilogram kid," weighing less than 2.3 pounds at birth. *What are some long-term outcomes for weighing so little at birth?*

Preterm and Small for Date Infants Three related conditions pose threats to many newborns: low birth weight, being preterm, and being small for date. **Low birth weight infants** weigh less than 5½ pounds at birth. *Very low birth weight* newborns weigh under 3½ pounds, and *extremely low birth weight* newborns weigh under 2 pounds. **Preterm infants** are those born three weeks or more before the pregnancy has reached its full term—in other words, before the completion of 37 weeks of gestation (the time between fertilization and birth). **Small for date infants** (also called *small for gestational age infants*) are those whose birth weight is below normal when the length of the pregnancy is considered. They weigh less than 90 percent of all babies of the same gestational age. Small for date infants may be preterm or full term. One study found that small for date infants had more than a fourfold risk of death (Regev & others, 2003).

In 2006, 12.8 percent of U.S. infants were born preterm—a 36 percent increase since the 1980s (National Center for Health Statistics, 2008). The increase in preterm birth is likely due to such factors as the increasing number of births to women 35 years and older, increasing rates of multiple births, increased management of maternal and fetal conditions (for example, inducing labor preterm if medical technology indicates it will increase the likelihood of survival), increased substance abuse (tobacco, alcohol), and increased stress (Goldenberg & Culcane, 2007). Ethnic variations characterize preterm birth (Balchin & Steer, 2007). For example, in 2006, the likelihood of being born preterm was 12.8 percent for all U.S. infants, but the rate was 18.5 percent for African American infants (National Center for Health Statistics, 2009).

Recently, there has been considerable interest generated in the role that progestin might play in reducing preterm births (O'Brien & Lewis, 2009). Recent research reviews indicate that progestin is most effective in reducing preterm births when it is administered to women with a history of a previous spontaneous birth at less than 37 weeks (da Fonseca & others, 2009), to women who have a short cervical length of 15 millimeters or less (da Fonseca & others, 2009), and to women with a singleton rather than twins (Norman & others, 2009; Rode & others, 2009).

Might exercise during pregnancy reduce the likelihood of preterm birth? A recent study found that compared to sedentary pregnant women, women who engaged in light leisure time physical activity had a 24 percent reduced likelihood of preterm delivery and those who participated in moderate to heavy leisure time physical activity had a 66 percent reduced risk of preterm delivery (Hegaard & others, 2008). Researchers also have found that yoga is positively linked to pregnancy outcomes (Narendran & others, 2005).

The incidence of low birth weight varies considerably from country to country. In some countries, such as India and Sudan, where poverty is rampant and the health and nutrition of mothers are poor, the percentage of low birth weight babies reaches as high as 31 percent (see Figure 3.7). In the United States, there has been an increase in low birth weight infants in the last two decades. The U.S. low birth weight rate of 8 percent in 2004 is considerably higher than that of many other developed countries (Hoyert & others, 2006). For example, only 4 percent of the infants born in Sweden, Finland, Norway, and Korea are low birth

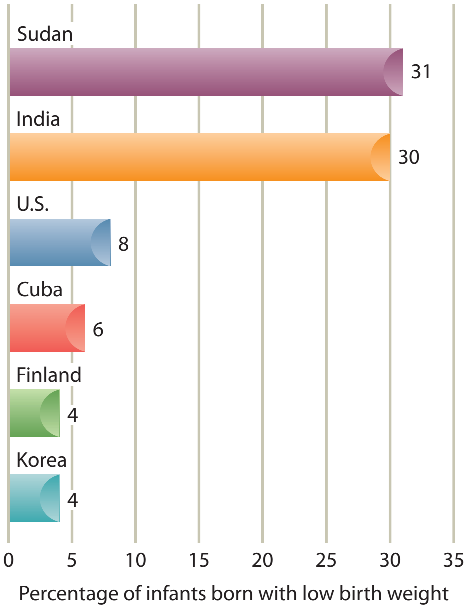


FIGURE **3.7**

PERCENTAGE OF INFANTS BORN WITH LOW BIRTH WEIGHT IN SELECTED COUNTRIES

developmental **connection**

Environment. Poverty continues to negatively affect development throughout childhood. Chapter 8, p. 264; Chapter 10, p. 338

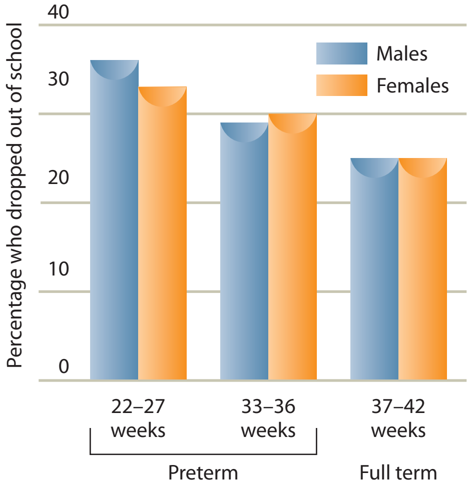


FIGURE **3.8**

PERCENTAGE OF PRETERM AND FULL-TERM BIRTH INFANTS WHO DROPPED OUT OF SCHOOL

weight, and only 5 percent of those born in New Zealand, Australia, and France are low birth weight.

In both developed and developing countries, adolescents who give birth when their bodies have not fully matured are at risk for having low birth weight babies (Malamitsi-Puchner & Boutsikou, 2006). In the United States, the increase in the number of low birth weight infants is due to such factors as the use of drugs, poor nutrition, multiple births, reproductive technologies, and improved technology and prenatal care that result in more high-risk babies surviving (Chen & others, 2007). Nonetheless, poverty still is a major factor in preterm births in the United States. Women living in poverty conditions are more likely to be obese, have diabetes and hypertension, smoke cigarettes and use illicit drugs, and be less likely to have regular prenatal care (Goldenberg & Nagahawatte, 2008).

Consequences of Preterm Birth and Low Birth Weight Although most preterm and low birth weight infants are healthy, as a group they have more health and developmental problems than normal birth weight infants (Minde & Zelkowitz, 2008). For preterm birth, the terms *extremely preterm* and *very preterm* are increasingly used (Lowdermilk, Perry, & Cashion, 2011). *Extremely preterm infants* are those born less than 28 weeks preterm, and *very preterm infants* are those born less than 33 weeks of gestational age. Figure 3.8 shows the results of a recent Norwegian study indicating that the earlier preterm infants are born the more likely they will drop out of school (Swamy, Ostbye, & Skjaerven, 2008).

The number and severity of these problems increase when infants are born very early and as their birth weight decreases. Survival rates for infants who are born very early and very small have risen, but with this improved survival rate have come increases in rates of severe brain damage (Casey, 2008).

Children born low in birth weight are more likely than their normal birth weight counterparts to develop a learning disability, attention deficit hyperactivity disorder, or breathing problems such as asthma (Santo, Portuguez, & Nunes, 2009). Approximately 50 percent of all low birth weight children are enrolled in special education programs.

A new mother practicing kangaroo care. *What is kangaroo care?*

Nurturing Low Birth Weight and Preterm Infants Two increasingly used interventions in the neonatal intensive care unit (NICU) are kangaroo care and massage therapy. **Kangaroo care** involves skin-to-skin contact in which the baby, wearing only a diaper, is held upright against the parent's bare chest, much as a baby kangaroo is carried by its mother (Ludington-Hoc & others, 2006). Kangaroo care is typically practiced for two to three hours per day, skin-to-skin over an extended time in early infancy.

Why use kangaroo care with preterm infants? Preterm infants often have difficulty coordinating their breathing and heart rate, and the close physical contact with the parent provided by kangaroo care can help to stabilize the preterm infant's heartbeat, temperature, and breathing (Nyqvist & others, 2010). Preterm infants who experience kangaroo care also gain more weight than their counterparts who are not given this care (Gathwala, Singh, & Balhara, 2008). A recent study also revealed that kangaroo care decreased pain responses in preterm infants (Johnston & others, 2009).

Many adults will attest to the therapeutic effects of receiving a massage. In fact, many will pay a premium to receive one at a spa on a regular basis. But can massage play a role in improving the developmental outcomes for preterm infants? To find out, see *Connecting Through Research*.

developmental **connection**

Attachment. A classic study with surrogate cloth and wire monkeys demonstrated the important role that touch plays in infant attachment. Chapter 6, p. 191

kangaroo care Treatment for preterm infants that involves skin-to-skin contact.

connecting through research

How Does Massage Therapy Affect the Mood and Behavior of Babies?

Throughout history and in many cultures, caregivers have massaged infants. In Africa and Asia, infants are routinely massaged by parents or other family members for several months after birth. In the United States, interest in using touch and massage to improve the growth, health, and well-being of infants has been stimulated by the research of Tiffany Field (2001, 2007; Diego, Field, & Hernandez-Reif, 2008; Field, Diego, & Hernandez-Reif, 2008, 2010; Field & others, 2006; Hernandez-Reif, Diego, & Field, 2007), director of the Touch Research Institute at the University of Miami School of Medicine.

Shown here is Tiffany Field massaging a newborn infant. *What types of infants has massage therapy been shown to help?*

In a recent study, preterm infants in a neonatal intensive care unit (NICU) were randomly assigned to a massage therapy group or a control group (Hernandez-Reif, Diego, & Field, 2007). For five consecutive days, the preterm infants in the massage group were given three 15-minute moderate pressure massages. Behavioral observations of the following stress behaviors were made on the first and last days of the study: crying, grimacing, yawning, sneezing, jerky arm and leg movements, startles, and finger flaring. The various stress behaviors were summarized in a composite stress behavior index. As indicated in Figure 3.9, massage had a stress-reducing effect on the preterm infants, which is especially important because they encounter numerous stressors while they are hospitalized.

In another study, Field and her colleagues (2004) tested a more cost-effective massage strategy. They taught mothers how to massage their full-term infants rather than having health care professionals do the massage. Beginning from day one of the newborn's life to the end of the first month, once a day before bedtime the mothers massaged the babies using either light or moderate pressure. Infants who were massaged with moderate pressure gained more weight, performed better on the orientation scale of the Brazelton, were less excitable and less depressed, and were less agitated during sleep.

Field has demonstrated the benefits of massage therapy for infants who face a variety of problems. For example, preterm infants exposed to cocaine in utero who received massage therapy gained weight and improved their scores on developmental tests (Wheeden & others, 1993). Another study investigated 1- to 3-month-old infants born to depressed adolescent mothers (Field & others, 1996). The infants of depressed mothers who received massage therapy had lower stress—as well as improved emotionality, sociability, and soothability—compared with the nonmassaged infants of depressed mothers.

In a research review of massage therapy with preterm infants, Field and her colleagues (2004) concluded that the most consistent findings involve two positive results: (1) increased weight gain and (2) discharge from the hospital from three to six days earlier.

Infants are not the only ones who may benefit from massage therapy (Field, 2007). In other studies, Field and her colleagues have demonstrated the benefits of massage therapy with women in reducing labor pain (Field, Hernandez-Reif, Taylor, & others, 1997), with children who have asthma (Field, Henteleff, & others, 1998), with autistic children's attentiveness (Field, Lasko, & others, 1997), and with adolescents who have attention deficit hyperactivity disorder (Field, Quintino, & others, 1998).

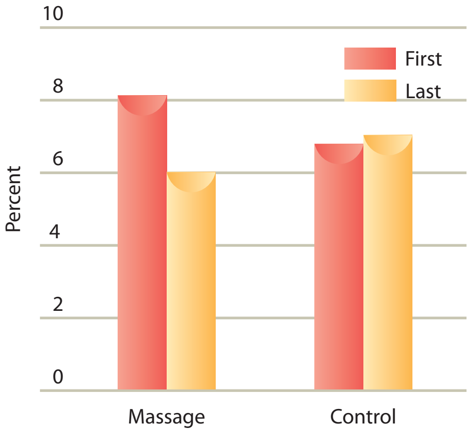


FIGURE **3.9**

PRETERM INFANTS SHOW REDUCED STRESS BEHAVIORS AND ACTIVITY AFTER FIVE DAYS OF MASSAGE THERAPY (HERNANDEZ-REIF, DIEGO, & FIELD, 2007). INFANT BEHAVIOR AND DEVELOPMENT, 30.

Review *Connect* Reflect

LG2 Discuss the birth process.

Review

- What are the three main stages of birth? What are some different birth strategies? What is the transition from fetus to newborn like for the infant?
- What are three measures of neonatal health and responsiveness?
- What are the outcomes for children if they are born preterm or with a low birth weight?

Connect

- What correlations have been found between birth weight and country of birth, and what might the causes be?

Reflect *Your Own Personal Journey of Life*

- If you are a female, which birth strategy do you prefer? Why? If you are a male, how involved would you want to be in helping your partner through the birth of your baby? Explain.

3 The Postpartum Period

LG3 Explain the changes that take place in the postpartum period.

Physical Adjustments

Emotional and Psychological Adjustments

Bonding

The weeks after childbirth present challenges for many new parents and their offspring. This is the **postpartum period,** the period after childbirth or delivery that lasts for about six weeks or until the mother's body has completed its adjustment and has returned to a nearly prepregnant state. It is a time when the woman adjusts, both physically and psychologically, to the process of childbearing.

The postpartum period involves a great deal of adjustment and adaptation. The adjustments needed are physical, emotional, and psychological.

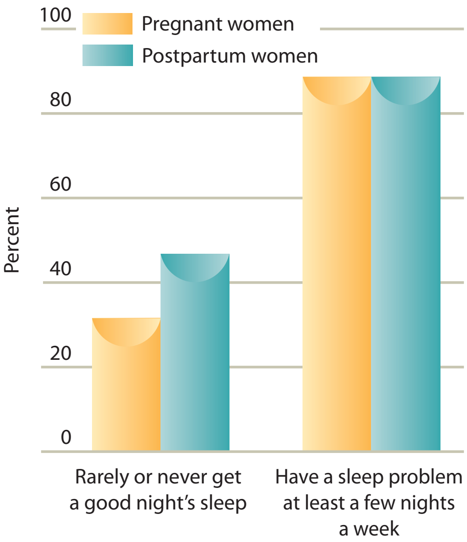


FIGURE **3.10**

SLEEP DEPRIVATION IN PREGNANT AND POSTPARTUM WOMEN

PHYSICAL ADJUSTMENTS

A woman's body makes numerous physical adjustments in the first days and weeks after childbirth (Mattson & Smith, 2011). She may have a great deal of energy or feel exhausted and let down. Though these changes are normal, the fatigue can undermine the new mother's sense of well-being and confidence in her ability to cope with a new baby and a new family life (Runquist, 2007).

A concern is the loss of sleep that the primary caregiver experiences in the postpartum period (Gunderson & others, 2008). In the 2007 Sleep in America survey, a substantial percentage of women reported loss of sleep during pregnancy and in the postpartum period (National Sleep Foundation, 2007) (see Figure 3.10). The loss of sleep can contribute to stress, marital conflict, and impaired decision making (Meerlo, Sgoifo, & Suchecki, 2008).

After delivery, a mother's body undergoes sudden and dramatic changes in hormone production. When the placenta is delivered, estrogen and progesterone levels drop steeply and remain low until the ovaries start producing hormones again.

Involution is the process by which the uterus returns to its prepregnant size five or six weeks after birth. Immediately following birth, the uterus weighs 2 to 3 pounds. By the end of five or six weeks, the uterus weighs 2 to 3½ ounces. Nursing the baby helps contract the uterus at a rapid rate.

EMOTIONAL AND PSYCHOLOGICAL ADJUSTMENTS

Emotional fluctuations are common for mothers in the postpartum period. For some women, emotional fluctuations decrease within several weeks after the delivery, but other women experience more long-lasting emotional swings.

postpartum period The period after childbirth when the mother adjusts, both physically and psychologically, to the process of childbirth. This period lasts for about six weeks or until her body has completed its adjustment and returned to a near prepregnant state.

connecting with careers

Diane Sanford, Clinical Psychologist and Postpartum Expert

Diane Sanford has a doctorate in clinical psychology and for many years she had a private practice that focused on marital and family relationships. But after she began collaborating with a psychiatrist whose clients included women with postpartum depression, Dr. Sanford, along with a women's health nurse, founded Women's Healthcare Partnership in St. Louis, Missouri, which specializes in women's adjustment during the postpartum period. Subsequently, they added a marriage and family relationships counselor and a social worker to their staff, and then later hired nurse educators, a dietician, and a fitness expert as consultants. (Source: Clay, R. (2001, February). Fulfilling an unmet need. *Monitor on Psychology, 2.*)

Diane Sanford holding an infant of one of the mothers who comes to her for help in coping with postpartum issues.

For more information about what clinical psychologists do, see page 46 in the Careers in Life-Span Development appendix.

As shown in Figure 3.11, about 70 percent of new mothers in the United States have what are called the postpartum blues. About two to three days after birth, they begin to feel depressed, anxious, and upset. These feelings may come and go for several months after the birth, often peaking about three to five days after birth. Even without treatment, these feelings usually go away after one or two weeks.

However, some women develop **postpartum depression,** which involves a major depressive episode that typically occurs about four weeks after delivery. In other words, women with postpartum depression have such strong feelings of sadness, anxiety, or despair that for at least a two-week period they have trouble coping with their daily tasks. Without treatment, postpartum depression may become worse and last for many months (Nolen-Hoeksema, 2011). And many women with postpartum treatment don't seek help. For example, one recent study found that 15 percent of the women reported postpartum depression symptoms but less than half sought help (McGarry & others, 2009). Estimates indicate that 10 to 14 percent of new mothers experience postpartum depression.

Several antidepressant drugs are effective in treating postpartum depression and appear to be safe for breast feeding women (Logsdon, Wisner, & Hanusa, 2009). Psychotherapy, especially cognitive therapy, also is an effective treatment of postpartum depression for many women (Beck, 2006). Also, engaging in regular exercise may help in treating postpartum depression (Daley, Macarthur, & Winter, 2007).

Can a mother's postpartum depression affect the way she interacts with her infant? A recent research review concluded that the interaction difficulties of depressed mothers and their infants occur across cultures and socioeconomic status groups, and encompass less sensitivity of the mothers and less responsiveness on the part of their infants (Field, 2010). Several caregiving activities also are compromised, including feeding (especially breast feeding), sleep routines, and safety practices. To read about one individual who specializes in women's adjustment during the postpartum period, see *Connecting With Careers.*

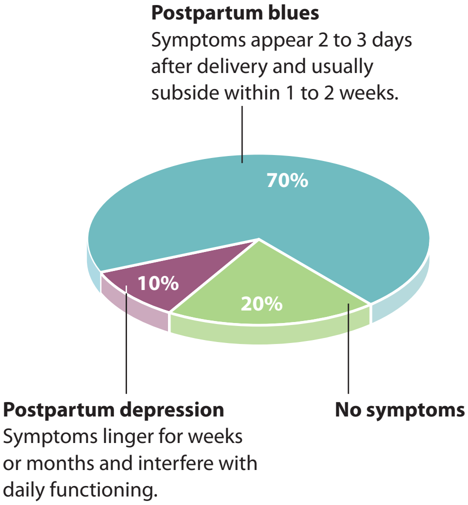


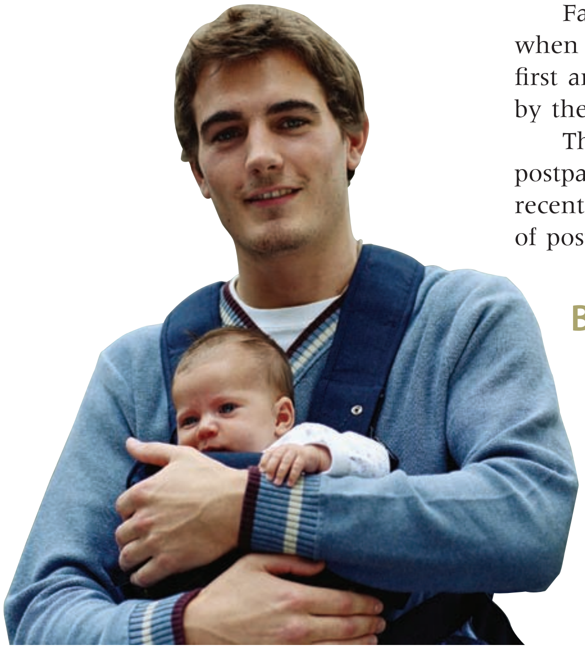
FIGURE **3.11**

POSTPARTUM BLUES AND POSTPARTUM DEPRESSION AMONG U.S. WOMEN. Some health professionals refer to the postpartum period as the "fourth trimester." Though the time span of the postpartum period does not necessarily cover three months, the term "fourth trimester" suggests continuity and the importance of the first several months after birth for the mother.

postpartum depression Characteristic of women who have such strong feelings of sadness, anxiety, or despair that they have trouble coping with daily tasks in the postpartum period.

Fathers also undergo considerable adjustment in the postpartum period, even when they work away from home all day. Many fathers feel that the baby comes first and gets all of the mother's attention; some feel that they have been replaced by the baby.

The father's support and caring can play a role in whether the mother develops postpartum depression or not (Dietz & others, 2009; Gao, Chan, & Mao, 2009). A recent study revealed that higher support by fathers was related to lower incidence of postpartum depression in women (Smith & Howard, 2008).



The postpartum period is a time of considerable adjustment and adaptation for both the mother and the father. Fathers can provide an important support system for mothers, especially in helping mothers care for young infants. *What kinds of tasks might the father of a newborn do to support the mother?*

BONDING

A special component of the parent-infant relationship is **bonding,** the formation of a connection, especially a physical bond between parents and the newborn in the period shortly after birth. Sometimes hospitals seem determined to deter bonding. Drugs given to the mother to make her delivery less painful can make the mother drowsy, interfering with her ability to respond to and stimulate the newborn. Mothers and newborns are often separated shortly after delivery, and preterm infants are isolated from their mothers even more than full-term infants.

Do these practices do any harm? Some physicians believe that during the period shortly after birth, the parents and newborn need to form an emotional attachment as a foundation for optimal development in years to come (Kennell, 2006; Kennell & McGrath, 1999). Is there evidence that close contact between mothers in the first several days after birth is critical for optimal development later in life? Although some research supports this bonding hypothesis (Klaus & Kennell, 1976), a body of research challenges the significance of the first few days of life as a critical period (Bakeman & Brown, 1980; Rode & others, 1981). Indeed, the extreme form of the bonding hypothesis—that the newborn must have close contact with the mother in the first few days of life to develop optimally—simply is not true.

developmental **connection**

Attachment. Lorenz demonstrated the importance of early bonding in greylag geese, but the first few days of life are unlikely to be a critical period for bonding in human infants. Chapter 1, p. 27

Nonetheless, the weakness of the bonding hypothesis should not be used as an excuse to keep motivated mothers from interacting with their newborns. Such contact brings pleasure to many mothers. In some mother-infant pairs—including preterm infants, adolescent mothers, and mothers from disadvantaged circumstances—early close contact may establish a climate for improved interaction after the mother and infant leave the hospital.

Many hospitals now offer a *rooming-in* arrangement, in which the baby remains in the mother's room most of the time during its hospital stay. However, if parents choose not to use this rooming-in arrangement, the weight of the research suggests that this decision will not harm the infant emotionally (Lamb, 1994).

bonding The formation of a close connection, especially a physical bond, between parents and their newborn in the period shortly after birth.

Review *Connect* Reflect

LG3 Explain the changes that take place in the postpartum period.

Review

- What does the postpartum period involve? What physical adjustments does the woman's body make in this period?
- What emotional and psychological adjustments characterize the postpartum period?
- Is bonding critical for optimal development?

Connect

- Compare and contrast what you learned about kangaroo care and breast feeding of preterm infants to what you learned about bonding and breast feeding when the mother is suffering from postpartum depression.

Reflect *Your Own Personal Journey of Life*

- If you are a female, what can you do to adjust effectively in the postpartum period? If you are a male, what can you do to help in the postpartum period?

topical **connections**

This chapter marks the beginning of our chronological look at the journey of life. In the next three chapters that comprise Section 3 of the book, we will follow the physical, cognitive, and socioemotional development of infants, including the related theories, research, and milestones associated with the first 18 to 24 months of life. You will learn about the remarkable and complex physical development of infants' motor skills, such as learning to walk; read about the early development of infants' cognitive skills, such as the ability to form concepts; and explore infants' surprisingly sophisticated socioemotional development, as reflected in the development of their motivation to share and perceive others' actions as intentionally motivated.

looking forward

reach your **learning goals**

1 Prenatal Development and Birth

LG1 Describe prenatal development.

The Course of Prenatal Development

- Prenatal development is divided into three periods: germinal (conception until 10 to 14 days later), which ends when the zygote (a fertilized egg) attaches to the uterine wall; embryonic (two to eight weeks after conception), during which the embryo differentiates into three layers, life-support systems develop, and organ systems form (organogenesis); and fetal (two months after conception until about nine months, or when the infant is born), a time when organ systems have matured to the point at which life can be sustained outside of the womb. The growth of the brain during prenatal development is nothing short of remarkable. By the time babies are born, they have approximately 100 billion neurons, or nerve cells. Neurogenesis is the term that means the formation of new neurons. The nervous system begins with the formation of a neural tube at 18 to 24 days after conception. Proliferation and migration are two processes that characterize brain development in the prenatal period. The basic architecture of the brain is formed in the first two trimesters of prenatal development.

Teratology and Hazards to Prenatal Development

- Teratology is the field that investigates the causes of congenital (birth) defects. Any agent that causes birth defects is called a teratogen. The dose, genetic susceptibility, and time of exposure influence the severity of the damage to an unborn child and the type of defect that occurs. Prescription drugs that can be harmful include antibiotics. Nonprescription drugs that can be harmful include diet pills, aspirin, and caffeine. Legal psychoactive drugs that are potentially harmful to prenatal development include alcohol and nicotine. Fetal alcohol spectrum disorders are a cluster of abnormalities that appear in offspring of mothers who drink heavily during pregnancy. Even when pregnant women drink moderately (one to two drinks a few days a week), negative effects on their offspring have been found. Cigarette smoking by pregnant women has serious adverse effects on prenatal and child development (such as low birth weight). Illegal psychoactive drugs that are potentially harmful to offspring include methamphetamine, marijuana, cocaine, and heroin. Incompatibility of the mother's and the father's blood types can also be harmful to the fetus. Environmental hazards include radiation, environmental pollutants, and toxic wastes. Syphilis, rubella (German measles), genital herpes, and AIDS are infectious diseases that can harm the fetus. Other parental factors include maternal diet and nutrition, age, emotional states and stress, and paternal factors. A developing fetus depends entirely on its mother for nutrition. Maternal age can negatively affect the offspring's development if the mother is an adolescent or over 35. High stress in the mother is linked with less than optimal prenatal and birth outcomes. Paternal factors that can adversely affect prenatal development include exposure to lead, radiation, certain pesticides, and petrochemicals.

Prenatal Care

- Prenatal care varies extensively but usually involves medical care services with a defined schedule of visits.

Normal Prenatal Development

- It is important to remember that, although things can and do go wrong during pregnancy, most of the time pregnancy and prenatal development go well.

2 Birth

LG2 Discuss the birth process.

The Birth Process

- Childbirth occurs in three stages. The first stage, which lasts about 6 to 12 hours for a woman having her first child, is the longest stage. The cervix dilates to about 10 centimeters (4 inches) at the end of the first stage. The second stage begins when the baby's head starts to move through the cervix and ends with the baby's complete emergence. The third stage involves the delivery of the placenta after birth. Childbirth strategies involve the childbirth setting and attendants. In many countries, a doula attends a childbearing woman. Methods of delivery include medicated, natural and prepared, and cesarean.

Assessing the Newborn

- For many years, the Apgar Scale has been used to assess the newborn's health. The Brazelton Neonatal Behavioral Assessment Scale examines the newborn's neurological development, reflexes, and reactions to people. Recently, the Neonatal Intensive Care Unit Network Neurobehavioral Scale (NNNS) was created to assess the at-risk infant.

Preterm and Low Birth Weight Infants

- Low birth weight infants weigh less than 5½ pounds, and they may be preterm (born before the completion of 37 weeks of gestation) or small for date (also called small for gestational age, which refers to infants whose birth weight is below normal when the length of pregnancy is considered). Small for date infants may be preterm or full term. Although most low birth weight and preterm infants are normal and healthy, as a group they have more health and developmental problems than normal birth weight infants. Kangaroo care and massage therapy have been shown to have benefits for preterm infants.

3 The Postpartum Period

LG3 Explain the changes that take place in the postpartum period.

Physical Adjustments

- The postpartum period is the name given to the period after childbirth or delivery. The period lasts for about six weeks or until the woman's body has completed its adjustment. Physical adjustments in the postpartum period include fatigue, involution (the process by which the uterus returns to its prepregnant size five or six weeks after birth), and hormonal changes.

Emotional and Psychological Adjustments

- Emotional fluctuations on the part of the mother are common in this period, and they can vary a great deal from one mother to the next. Postpartum depression characterizes women who have such strong feelings of sadness, anxiety, or despair that they have trouble coping with daily tasks in the postpartum period. Postpartum depression occurs in about 10 percent of new mothers. The father also goes through a postpartum adjustment.

Bonding

- Bonding is the formation of a close connection, especially a physical bond between parents and the newborn shortly after birth. Early bonding has not been found to be critical in the development of a competent infant.

key terms

germinal period 81
blastocyst 81
trophoblast 81
embryonic period 81
amnion 82
umbilical cord 82
placenta 82
organogenesis 82
fetal period 83
neurons 86
teratogen 86
fetal alcohol spectrum disorders (FASD) 88
afterbirth 94
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section **three**

Babies are such a nice way to start people.

—**Don Herold**
American Writer, 20th Century

Infancy

As newborns, we were not empty-headed organisms. We had some basic reflexes, among them crying, kicking, and coughing. We slept a lot, and occasionally we smiled, although the meaning of our first smiles was not entirely clear. We ate and we grew. We crawled and then we walked, a journey of a thousand miles beginning with a single step. Sometimes we conformed; sometimes others conformed to us. Our development was a continuous creation of more complex forms. Our helpless kind demanded the meeting eyes of love. We juggled the necessity of curbing our will with becoming what we could will freely. Section 3 contains three chapters: "Physical Development in Infancy" (Chapter 4), "Cognitive Development in Infancy" (Chapter 5), and "Socioemotional Development in Infancy" (Chapter 6).

chapter 4

PHYSICAL DEVELOPMENT IN INFANCY

chapter **outline**

1 Physical Growth and Development in Infancy

Learning Goal 1 Discuss physical growth and development in infancy.

Patterns of Growth
Height and Weight
The Brain
Sleep
Nutrition

2 Motor Development

Learning Goal 2 Describe infants' motor development.

The Dynamic Systems View
Reflexes
Gross Motor Skills
Fine Motor Skills

3 Sensory and Perceptual Development

Learning Goal 3 Summarize the course of sensory and perceptual development in infancy.

What Are Sensation and Perception?
The Ecological View
Visual Perception
Other Senses
Intermodal Perception
Nature, Nurture, and Perceptual Development
Perceptual-Motor Coupling

Latonya is a newborn baby in Ghana. During her first days of life, she has been kept apart from her mother and bottle fed. Manufacturers of infant formula provide the hospital where she was born with free or subsidized milk powder. Her mother has been persuaded to bottle feed rather than breast feed her. When her mother bottle feeds Latonya, she overdilutes the milk formula with unclean water. Latonya's feeding bottles have not been sterilized. Latonya becomes very sick. She dies before her first birthday.

Ramona was born in Nigeria with a "baby-friendly" program. In this program, babies are not separated from their mothers when they are born, and the mothers are encouraged to breast feed them. The mothers are told of the perils that bottle feeding can bring because of unsafe water and unsterilized bottles. They also are informed about the advantages of breast milk, which include its nutritious and hygienic qualities, its ability to immunize babies against common illnesses, and its role in reducing the mother's risk of breast and ovarian cancer. Ramona's mother is breast feeding her. At 1 year of age, Ramona is very healthy.

For many years, maternity units in hospitals favored bottle feeding and did not give mothers adequate information about the benefits of breast feeding. In recent years, the World Health Organization and UNICEF have tried to reverse the trend toward bottle feeding of infants in many impoverished countries. They instituted the "baby-friendly" program in many countries (Grant, 1993). They also persuaded the International Association of Infant Formula Manufacturers to stop marketing their baby formulas to hospitals in countries where the governments support the baby-friendly initiatives (Grant, 1993). For the hospitals themselves, costs actually were reduced as infant formula, feeding bottles, and separate nurseries become unnecessary. For example, baby-friendly Jose Fabella Memorial Hospital in the Philippines reported saving 8 percent of its annual budget. Still, there are many places in the world where the baby-friendly initiatives have not been implemented.

The advantages of breast feeding in impoverished countries are substantial. However, these advantages must be balanced against the risk of passing HIV to the babies

(*Top*) An HIV-infected mother breast feeding her baby in Nairobi, Africa. (*Bottom*) A Rhwandan mother bottle feeding her baby. *What are some concerns about breast versus bottle feeding in impoverished African countries?*

topical **connections:**

In the previous chapter, we followed the physical development that takes place from fertilization through the germinal, embryonic, and fetal periods of prenatal development. We learned that by the time the fetus has reached full gestational age (approximately 40 weeks), it has grown from a fertilized egg, barely visible to the human eye, to a fully formed human of approximately 7½ pounds and 20 inches in length. Also remarkable, by the end of the prenatal period the brain has developed approximately 100 billion neurons.

looking ***back***

through breast milk if the mothers have the virus; the majority of mothers don't know that they are infected (Gumbo & others, 2010; Oladokun, Brown, & Osinusi, 2010). In some areas of Africa, more than 30 percent of mothers have the human immunodeficiency virus (HIV). Later in the chapter, in the section on nutrition, we will look more closely at recent research on breast feeding in the U.S., outlining the benefits for infants and mothers and discussing several life-threatening diseases that infants can contract as a result of malnutrition.

preview

It is very important for infants to get a healthy start. When they do, their first two years of life are likely to be a time of amazing development. In this chapter, we focus on the biological domain and the infant's physical development, exploring physical growth, motor development, and sensory and perceptual development.

1 Physical Growth and Development in Infancy

LG1 Discuss physical growth and development in infancy.

- Patterns of Growth
- Height and Weight
- The Brain
- Sleep
- Nutrition

Infants' physical development in the first two years of life is extensive. Newborns' heads are quite large when compared with the rest of their bodies. They have little strength in their necks and cannot hold their heads up, but they have some basic reflexes. In the span of 12 months, infants become capable of sitting anywhere, standing, stooping, climbing, and usually walking. During the second year, growth decelerates, but rapid increases in such activities as running and climbing take place. Let's now examine in greater detail the sequence of physical development in infancy.

PATTERNS OF GROWTH

An extraordinary proportion of the total body is occupied by the head during prenatal development and early infancy (see Figure 4.1). The **cephalocaudal pattern** is the sequence in which the earliest growth always occurs at the top—the head—with physical growth and differentiation of features gradually working their way down from top to bottom (for example, shoulders, middle trunk, and so on) (Pedroso, 2008). This same pattern occurs in the head area, because the top parts of the head—the eyes and brain—grow faster than the lower parts, such as the jaw.

Motor development generally proceeds according to the cephalocaudal principle. For example, infants see objects before they can control their torso, and they can use their hands long before they can crawl or walk. However, development does not follow a rigid blueprint. One study found that infants reached for toys with their feet prior to reaching with their hands (Galloway & Thelen, 2004). On average, infants first touched the toy with their feet when they were 12 weeks old and with their hands when they were 16 weeks old.

Growth also follows the **proximodistal pattern,** the sequence in which growth starts at the center of the body and moves toward the extremities. For example, infants control the muscles of their trunk and arms before they control their hands and fingers, and they use their whole hands before they can control several fingers.

cephalocaudal pattern The sequence in which the earliest growth always occurs at the top—the head—with physical growth in size, weight, and feature differentiation gradually working from top to bottom.

proximodistal pattern The sequence in which growth starts at the center of the body and moves toward the extremities.

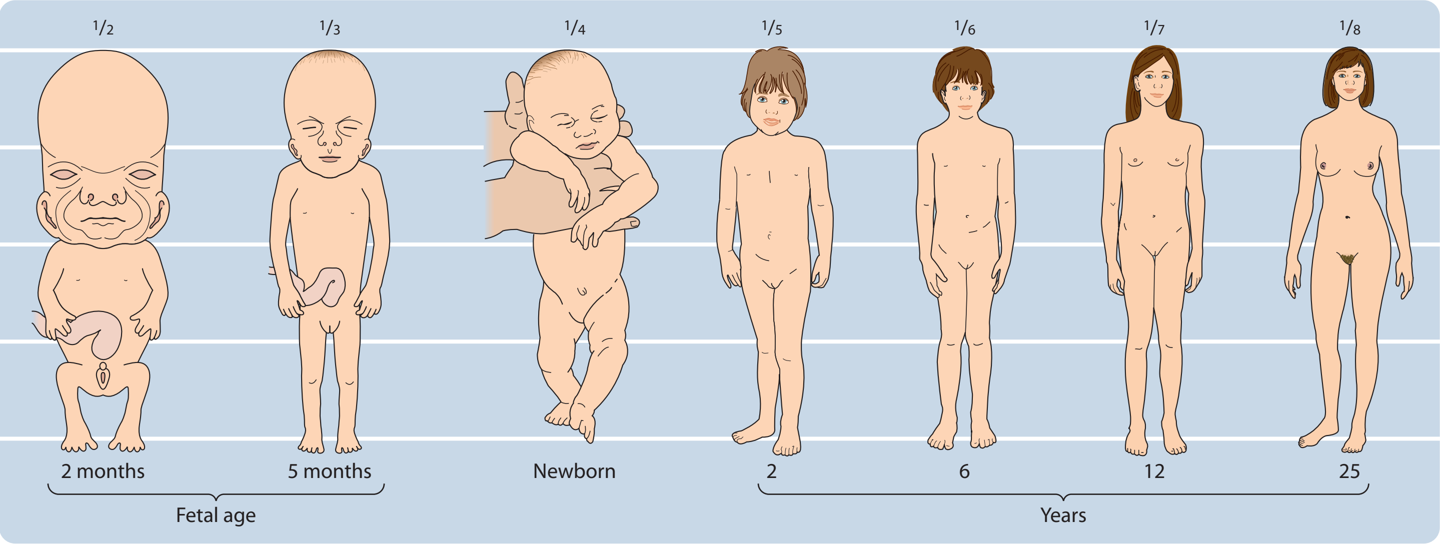


FIGURE **4.1**

CHANGES IN PROPORTIONS OF THE HUMAN BODY DURING GROWTH. As individuals develop from infancy through adulthood, one of the most noticeable physical changes is that the head becomes smaller in relation to the rest of the body. The fractions listed refer to head size as a proportion of total body length at different ages.

HEIGHT AND WEIGHT

The average North American newborn is 20 inches long and weighs 7 pounds. Ninety-five percent of full-term newborns are 18 to 22 inches long and weigh between 5 and 10 pounds.

In the first several days of life, most newborns lose 5 to 7 percent of their body weight before they adjust to feeding by sucking, swallowing, and digesting. Then they grow rapidly, gaining an average of 5 to 6 ounces per week during the first month. They have doubled their birth weight by the age of 4 months and have nearly tripled it by their first birthday. Infants grow about 1 inch per month during the first year, approximately doubling their birth length by their first birthday.

Growth slows considerably in the second year of life. By 2 years of age, infants weigh approximately 26 to 32 pounds, having gained a quarter to half a pound per month during the second year; now they have reached about one-fifth of their adult weight. At 2 years of age, the average infant is 32 to 35 inches in height, which is nearly half of their adult height.

FIGURE **4.2**

MEASURING THE ACTIVITY OF AN INFANT'S BRAIN. By attaching up to 128 electrodes to a baby's scalp to measure the brain's activity, Charles Nelson and his colleagues (2006) have found that even newborns produce distinctive brain waves that reveal they can distinguish their mother's voice from another woman's, even while they are asleep. *Why is it so difficult to measure infants' brain activity?*

THE BRAIN

We described the amazing growth of the brain from conception to birth in Chapter 3. By the time it is born, the infant that began as a single cell is estimated to have a brain that contains approximately 100 billion nerve cells, or neurons. Extensive brain development continues after birth, through infancy and later (Diamond, Casey, & Munakata, 2011; Nelson, 2011). Because the brain is still developing so rapidly in infancy, the infant's head should be protected from falls or other injuries and the baby should never be shaken. *Shaken baby syndrome,* which includes brain swelling and hemorrhaging, affects hundreds of babies in the United States each year (Croucher, 2010; Fanconi & Lips, 2010). A recent analysis found that fathers were the most often perpetrators of shaken baby syndrome, followed by child care providers, and a boyfriend of the victim's mother (National Center on Shaken Baby Syndrome, 2010).

Studying the brain's development in infancy is not as easy as it might seem. Even the latest

developmental **connection**

Brain Development. How does the brain change from conception to birth? Chapter 3, p. 86

brain-imaging technologies (described in Chapter 1) cannot make out fine details in adult brains and cannot be used with babies (Nelson, 2011). Positron-emission tomography (PET) scans pose a radiation risk to babies, and infants wriggle too much to capture accurate images using magnetic resonance imaging (MRI). However, researchers have been successful in using the electroencephalogram (EEG), a measure of the brain's electrical activity, to learn about the brain's development in infancy (Bell & Wolfe, 2007). Among the researchers who are making strides in finding out more about the brain's development in infancy are Charles Nelson and his colleagues (Nelson, 2011; Nelson, Thomas, & de Haan, 2006) (see Figure 4.2).

FIGURE **4.3**

THE HUMAN BRAIN'S HEMISPHERES. The two hemispheres of the human brain are clearly seen in this photograph. It is a myth that the left hemisphere is the exclusive location of language and logical thinking or that the right hemisphere is the exclusive location of emotion and creative thinking.

The Brain's Development

At birth, the newborn's brain is about 25 percent of its adult weight. By the second birthday, the brain is about 75 percent of its adult weight. However, the brain's areas do not mature uniformly.

Mapping the Brain Scientists analyze and categorize areas of the brain in numerous ways (Levene & Chervenak, 2009; Nelson, 2011). We are most concerned with the portion farthest from the spinal cord known as the *forebrain,* which includes the cerebral cortex and several structures beneath it. The *cerebral cortex* covers the forebrain like a wrinkled cap. It has two halves, or hemispheres (see Figure 4.3). Based on ridges and valleys in the cortex, scientists distinguish four main areas, called lobes, in each hemisphere. Although the lobes usually work together, each has a somewhat different primary function (see Figure 4.4):

- *Frontal lobes* are involved in voluntary movement, thinking, personality, and intentionality or purpose.
- *Occipital lobes* function in vision.
- *Temporal lobes* have an active role in hearing, language processing, and memory.
- *Parietal lobes* play important roles in registering spatial location, attention, and motor control.

To some extent, the type of information handled by neurons depends on whether they are in the left or right hemisphere of the cortex (McKone, Crookes, & Kanwisher, 2010). Speech and grammar, for example, depend on activity in the left hemisphere in most people; humor and the use of metaphors depends on activity in the right hemisphere (Hornickel, Skoe, & Kraus, 2008). This specialization of function in one hemisphere of the cerebral cortex or the other is called **lateralization.** However, most neuroscientists agree that complex functions such as reading or performing music involve both hemispheres (Stroobant, Buijus, & Vingerhoets, 2009). Labeling people as "left-brained" because they are logical thinkers and "right-brained" because they are creative thinkers does not correspond to the way the brain's hemispheres work. Complex thinking in normal people is the outcome of communication between both hemispheres of the brain (Liegeois & others, 2008).

At birth, the hemispheres of the cerebral cortex already have started to specialize: Newborns show greater electrical brain activity in the left hemisphere than the right hemisphere when they are listening to speech sounds (Hahn, 1987). How are the areas of the brain different in the newborn and the infant from those in an adult, and why do the differences matter? Important differences have been documented at both the cellular and the structural levels.

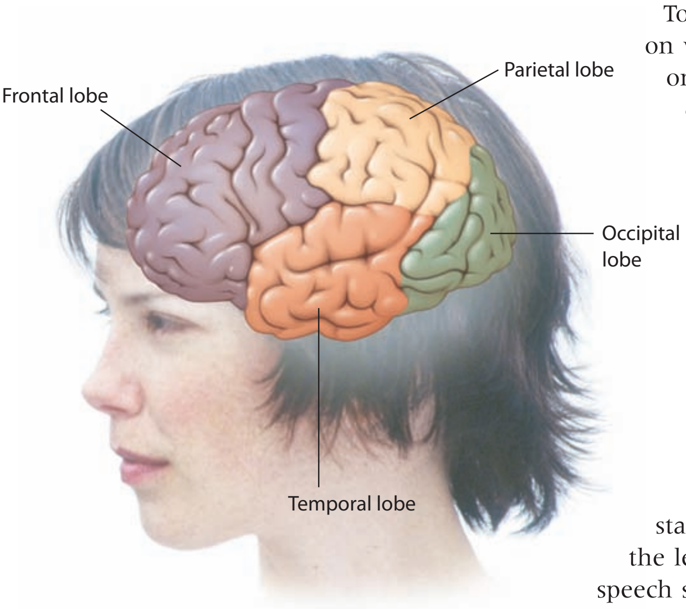


FIGURE **4.4**

THE BRAIN'S FOUR LOBES. Shown here are the locations of the brain's four lobes: frontal, occipital, temporal, and parietal.

Changes in Neurons Within the brain, the type of nerve cells called neurons send electrical and chemical signals, communicating with each other. As we indicated in Chapter 3, a *neuron* is a nerve cell that handles information processing (see Figure 4.5). Extending from the neuron's cell body are two types of fibers known as axons and dendrites. Generally, the axon carries signals away from the cell body and

lateralization Specialization of function in one hemisphere of the cerebral cortex or the other.

dendrites carry signals toward it. A *myelin sheath,* which is a layer of fat cells, encases many axons (see Figure 4.5). The myelin sheath insulates axons and helps electrical signals travel faster down the axon. Myelination also may be involved in providing energy to neurons and in communication (Haynes & others, 2006). At the end of the axon are terminal buttons, which release chemicals called *neurotransmitters* into *synapses,* which are tiny gaps between neurons' fibers. Chemical interactions in synapses connect axons and dendrites, allowing information to pass from neuron to neuron (Turrigiano, 2010). Think of the synapse as a river that blocks a road. A grocery truck arrives at one bank of the river, crosses by ferry, and continues its journey to market. Similarly, a message in the brain is "ferried" across the synapse by a neurotransmitter, which pours out information contained in chemicals when it reaches the other side of the river.

Neurons change in two very significant ways during the first years of life. First, *myelination,* the process of encasing axons with fat cells, begins prenatally and continues after birth, even into adolescence (Jackson-Newsom & Shelton, 2010). Second, connectivity among neurons increases, creating new neural pathways, as Figure 4.6 illustrates. New dendrites grow, connections among dendrites increase, and synaptic connections between axons and dendrites proliferate. Whereas myelination speeds up neural transmissions, the expansion of dendritic connections facilitates the spreading of neural pathways in infant development.

Researchers have discovered an intriguing aspect of synaptic connections (Kelsch, Sim, & Lois, 2010). Nearly twice as many of these connections are made as will ever be used (Huttenlocher & Dabholkar, 1997). The connections that are used become strengthened and survive, while the unused ones are replaced by other pathways or disappear. In the language of neuroscience, these connections will be "pruned" (Faissner & others, 2010). For example, the more babies engage in physical activity or use language, the more those pathways will be strengthened.

Changes in Regions of the Brain Figure 4.7 vividly illustrates the dramatic growth and later pruning of synapses in the visual, auditory, and prefrontal cortex (Huttenlocher & Dabholkar, 1997). Notice that "blooming and pruning" vary considerably by brain region. For example, the peak of synaptic overproduction in the visual cortex occurs at about the fourth postnatal month, followed by a gradual retraction until the middle to end of the preschool years. In areas of the brain involved in hearing and language, a similar, though somewhat later, course is detected. However, in the *prefrontal cortex,* the area of the brain where higher-level thinking and self-regulation occur, the peak of overproduction takes place at about 1 year of age; it is not until middle to late adolescence that the adult density of synapses is achieved. Both heredity and environment are thought to influence the timing and course of synaptic overproduction and subsequent retraction.

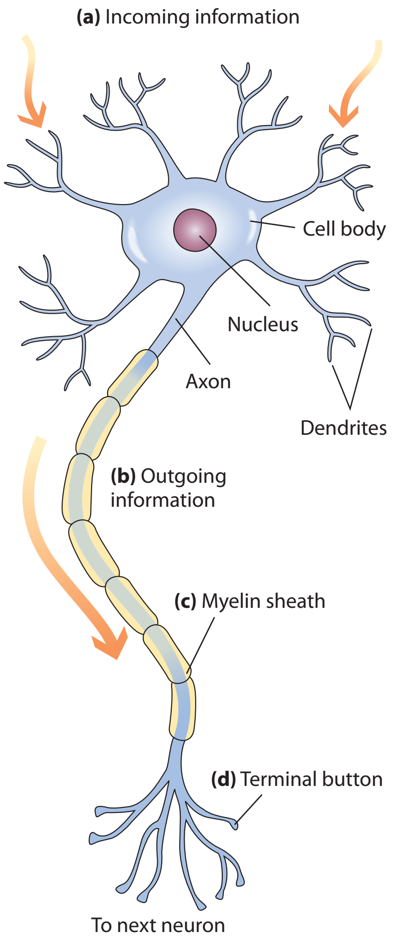
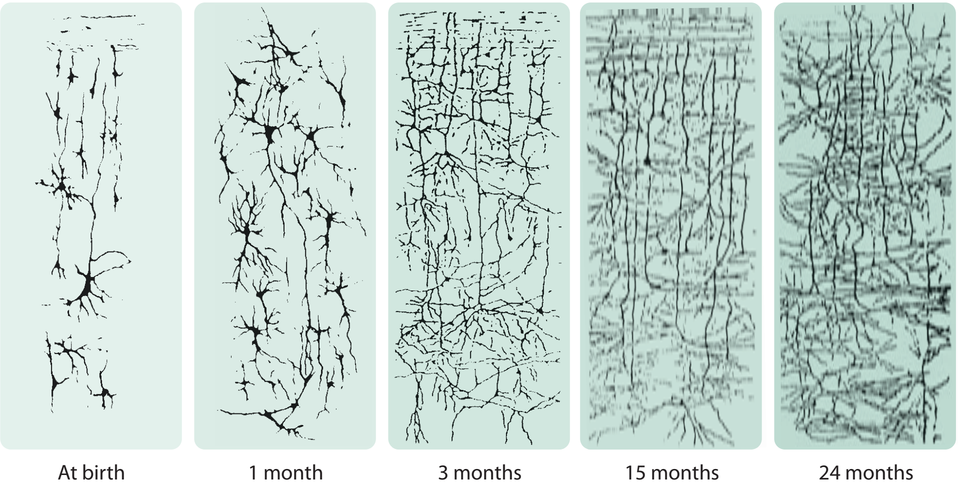


FIGURE **4.5**

THE NEURON. (*a*) The dendrites of the cell body receive information from other neurons, muscles, or glands through the axon. (*b*) Axons transmit information away from the cell body. (*c*) A myelin sheath covers most axons and speeds information transmission. (*d*) As the axon ends, it branches out into terminal buttons.

developmental **connection**

Brain Development. Changes in the prefrontal cortex in adolescents and older adults have important implications for their cognitive development. Chapter 11, p. 357; Chapter 17, p. 539



At birth 1 month 3 months 15 months 24 months

FIGURE **4.6**

THE DEVELOPMENT OF DENDRITIC SPREADING. Note the increase in connectedness between neurons over the course of the first two years of life.

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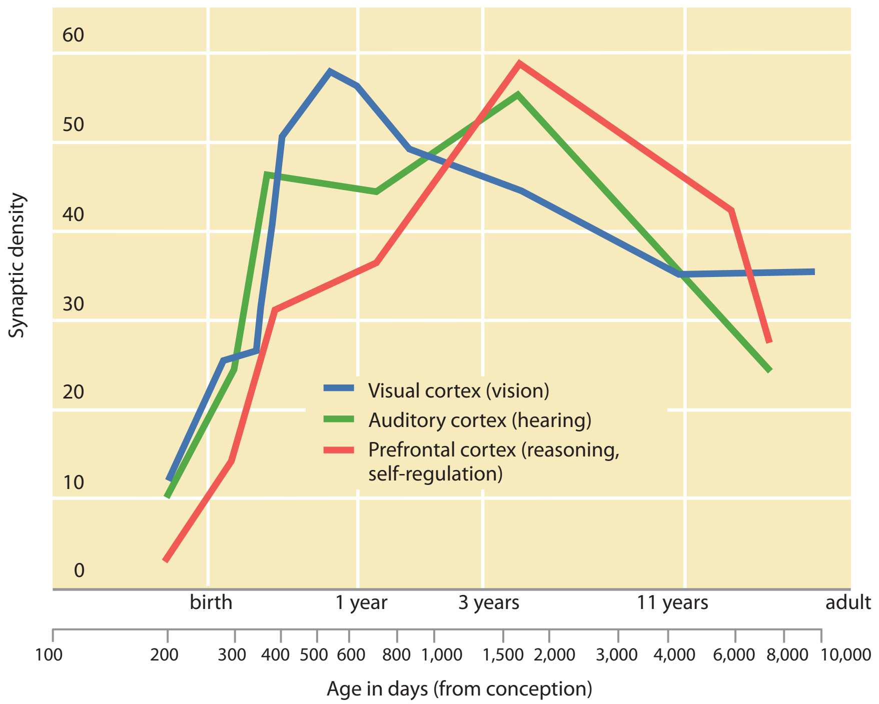


FIGURE **4.7**

SYNAPTIC DENSITY IN THE HUMAN BRAIN FROM INFANCY TO ADULTHOOD. The graph shows the dramatic increase and then pruning in synaptic density for three regions of the brain: visual cortex, auditory cortex, and prefrontal cortex. Synaptic density is believed to be an important indication of the extent of connectivity between neurons.

Meanwhile, the pace of myelination also varies in different areas of the brain (Gogtay & Thompson, 2010). Myelination for visual pathways occurs rapidly after birth and is completed in the first six months. Auditory myelination is not completed until 4 or 5 years of age.

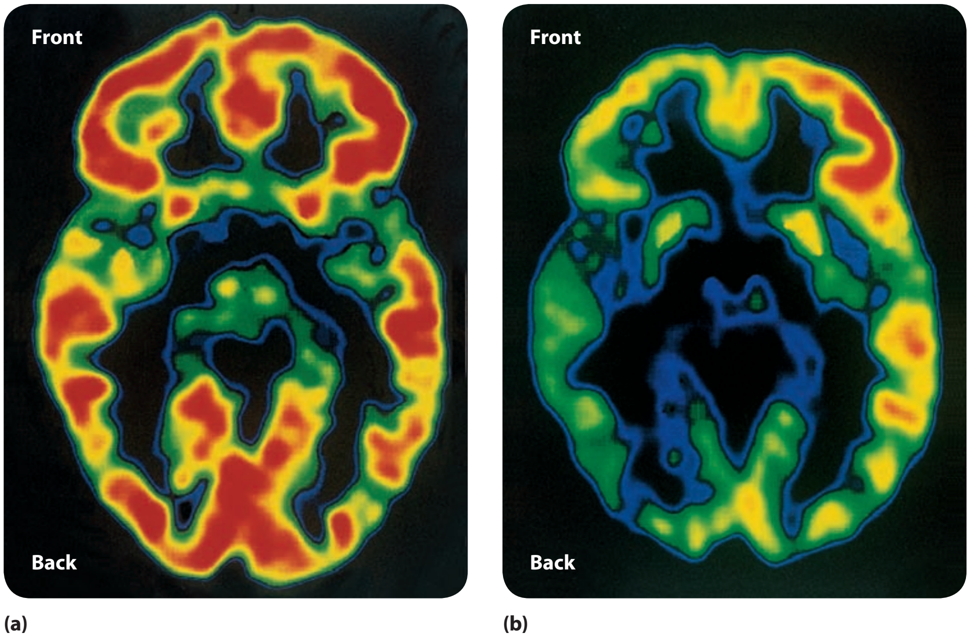
In general, some areas of the brain, such as the primary motor areas, develop earlier than others, such as the primary sensory areas. The frontal lobes are immature in the newborn. However, as neurons in the frontal lobes become myelinated and interconnected during the first year of life, infants develop an ability to regulate their physiological states, such as sleep, and gain more control over their reflexes. Cognitive skills that require deliberate thinking do not emerge until later in the first year (Bell & Fox, 1992; Bell & Morasch, 2007). Indeed, the prefrontal region of the frontal lobe has the most prolonged development of any brain region, with changes detectable at least into emerging adulthood (Steinberg, 2009).

Early Experience and the Brain Children who grow up in a deprived environment may have depressed brain activity (Pollak & others, 2010). As shown in Figure 4.8, a child who grew up in the unresponsive and unstimulating environment of a Romanian orphanage showed considerably depressed brain activity compared with a normal child.

Are the effects of deprived environments irreversible? There is reason to think the answer is no. The brain demonstrates both flexibility and resilience. Consider 14-year-old Michael Rehbein. At age 7, he began to experience uncontrollable seizures—as many as 400 a day. Doctors said the only solution was to remove the left hemisphere of his brain where the seizures were occurring. Recovery was slow, but his right hemisphere began to reorganize and take over functions that normally

developmental **connection**

Sleep. Sleep patterns change in adolescence and are linked to changes in the brain. Chapter 11, p. 364



(a) **(b)**

FIGURE **4.8**

EARLY DEPRIVATION AND BRAIN ACTIVITY. These two photographs are PET (positron emission tomography) scans—which use radioactive tracers to image and analyze blood flow and metabolic activity in the body's organs. These scans show the brains of (*a*) a normal child and (*b*) an institutionalized Romanian orphan who experienced substantial deprivation since birth. In PET scans, the highest to lowest brain activity is reflected in the colors of red, yellow, green, blue, and black, respectively. As can be seen, red and yellow show up to a much greater degree in the PET scan of the normal child than the deprived Romanian orphan.

occur in the brain's left hemisphere, including speech (see Figure 4.9). A recent study of 10 children who had experienced an arterial stroke perinatally (during or around birth) revealed that in 8 of the 10 the right hemisphere was dominant in processing language (Guzzetta & others, 2008).

Neuroscientists believe that what wires the brain—or rewires it, in the case of Michael Rehbein—is repeated experience. Each time a baby tries to touch an attractive object or gazes intently at a face, tiny bursts of electricity shoot through the brain, knitting together neurons into circuits. The results are some of the behavioral milestones we discuss in this chapter.

In sum, the infant's brain depends on experiences to determine how connections are made. Before birth, it appears that genes mainly direct basic wiring patterns. Neurons grow and travel to distant places awaiting further instructions (Nelson, 2011). After birth, the inflowing stream of sights, sounds, smells, touches, language, and eye contact help shape the brain's neural connections (Fox, Levitt, & Nelson, 2010).

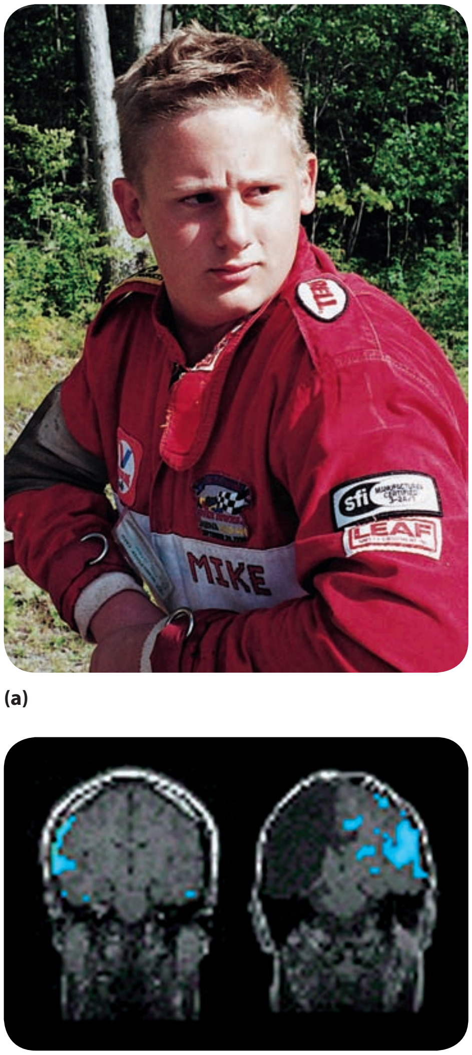


FIGURE **4.9**

PLASTICITY IN THE BRAIN'S HEMISPHERES. (*a*) Michael Rehbein at 14 years of age. (*b*) Michael's right hemisphere (*top*) has reorganized to take over the language functions normally carried out by corresponding areas in the left hemisphere of an intact brain (*bottom*). However, the right hemisphere is not as efficient as the left, and more areas of the brain are recruited to process speech.

SLEEP

When we were infants, sleep consumed more of our time than it does now. The typical newborn sleeps approximately 18 hours a day, but newborns vary a lot in how much they sleep (Sadeh, 2008). The range is from about 10 hours to about 21 hours.

Infants also vary in their preferred times for sleeping and their patterns of sleep. Although the total amount of time spent sleeping remains somewhat consistent, an infant may change from sleeping 7 or 8 hours several times a day to sleeping for only a few hours three or four times a day. By about 1 month of age, many American infants have begun to sleep longer at night. By 6 months of age, they usually have moved closer to adult-like sleep patterns, spending the most time sleeping at night and the most time awake during the day (Sadeh, 2008).

The most common infant sleep-related problem reported by parents is night waking. Surveys indicate that 20 to 30 percent of infants have difficulty going to sleep at night and sleeping through the night (Sadeh, 2008). What factors are involved in infant night waking? Infant night-waking problems have consistently been linked to excessive parental involvement in sleep-related interactions with their infant (Sadeh, 2008). Also, a study of 9-month-old infants revealed that more time awake at night was linked to intrinsic factors such as daytime crying and fussing, and extrinsic factors such as distress when separated from the mother, breast feeding, and sleeping with parents in their bed (DeLeon & Karraker, 2007).

Cultural variations influence infant sleeping patterns. For example, in the Kipsigis culture in Kenya, infants sleep with their mothers at night and are permitted to nurse on demand (Super & Harkness, 1997). During the day, they are strapped to their mothers' backs, accompanying them on daily rounds of chores and social activities. As a result, the Kipsigis infants do not sleep through the night until much later than American infants do. During the first eight months of postnatal life, Kipsigis infants rarely sleep longer than three hours at a stretch, even at night. This sleep pattern contrasts with that of American infants, many of whom begin to sleep up to eight hours a night by 8 months of age.

REM Sleep In REM sleep, the eyes flutter beneath closed lids; in non-REM sleep, this type of eye movement does not occur and sleep is more quiet. Figure 4.10 shows developmental changes in the average number of total hours spent in REM and non-REM sleep. By the time they reach adulthood, individuals spend about one-fifth of their night in REM sleep, and REM sleep usually appears about one hour after non-REM sleep. However, about half of an infant's sleep is REM sleep, and infants often begin their sleep cycle with REM sleep rather than non-REM sleep. A much greater amount of time is taken up by REM sleep in infancy than at any other point in the life span. By the time

> Sleep that knits up the
> ravelled sleave of care . . . Balm of
> hurt minds, nature's second course.
> Chief nourisher in life's feast.
>
> —William Shakespeare
> *English Playwright, 17th Century*

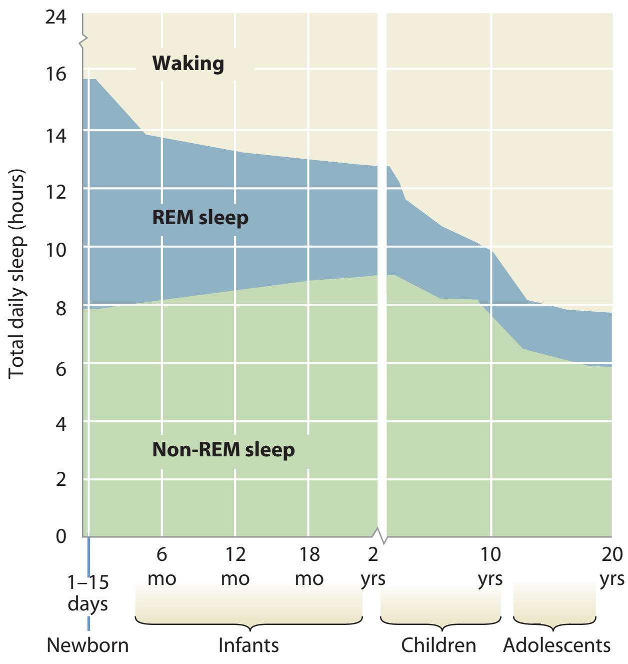


FIGURE **4.10**

DEVELOPMENTAL CHANGES IN REM AND NON-REM SLEEP

infants reach 3 months of age, the percentage of time they spend in REM sleep falls to about 40 percent, and REM sleep no longer begins their sleep cycle.

Why do infants spend so much time in REM sleep? Researchers are not certain. The large amount of REM sleep may provide infants with added self-stimulation, since they spend less time awake than do older children. REM sleep also might promote the brain's development in infancy (Graven, 2006).

When adults are awakened during REM sleep, they frequently report that they have been dreaming, but when they are awakened during non-REM sleep, they are much less likely to report they have been dreaming (Cartwright & others, 2006; Dement, 2005). Since infants spend more time than adults in REM sleep, can we conclude that they dream a lot? We don't know whether infants dream or not, because they don't have any way of reporting dreams.

Shared Sleeping Sleeping arrangements for newborns vary from culture to culture (Mindell & others, 2010a, b). For example, sharing a bed with a mother is a common practice in many cultures, such as Guatemala and China, whereas in others, such as the United States and Great Britain, newborns sleep in a crib, either in the same room as the parents or in a separate room. In some cultures, infants sleep with the mother until they are weaned, after which they sleep with siblings until middle and late childhood (Walker, 2006). Whatever the sleeping arrangements, it is recommended that the infant's bedding provide firm support and that cribs should have side rails.

Shared sleeping, or co-sleeping, is a controversial issue among experts (Sadeh, 2008). According to some child experts, shared sleeping brings several benefits: It promotes breast feeding and a quicker response to the baby's cries, and it allows the mother to detect potentially dangerous breathing pauses in the baby (Pelayo & others, 2006). However, shared sleeping remains a controversial issue, with some experts recommending it, others arguing against it (Adams, Good, & Defranco, 2009). The American Academy of Pediatrics. Task Force on Infant Positioning and SIDS (AAPT-FIPS, 2000) discourages shared sleeping. The Task Force concluded that bed sharing increases the risk that the sleeping mother will roll over onto her baby or increase the risk of sudden infant death syndrome (SIDS). Studies have found that bed sharing is linked with a greater incidence of SIDS, especially when parents smoke (Alm, Lagercrantz, & Wennergren, 2006; Bajanowski & others, 2007). Also, shared sleeping is likely to place the infant at risk more if the caregivers are impaired by alcohol, smoking, or being overly tired (Baddock & others, 2007; Ostfield & others, 2010). And recent studies indicate that African American mothers and their infants are more likely to bed share than non-Latino White mothers (Fu & others, 2008; Hauck & others, 2008).

SIDS **Sudden infant death syndrome (SIDS)** is a condition that occurs when infants stop breathing, usually during the night, and die suddenly without an apparent cause. SIDS remains the highest cause of infant death in the United States with nearly 3,000 infant deaths annually attributed to SIDS (The Hospital for Sick Children & others, 2010). Risk of SIDS is highest at 2 to 4 months of age (NICHD, 2010).

Since 1992, the American Academy of Pediatrics (AAP) has recommended that infants be placed to sleep on their backs to reduce the risk of SIDS, and the frequency of prone sleeping among U.S. infants has dropped dramatically (AAPTFIPS, 2000). Researchers have found that SIDS does indeed decrease when infants sleep on their backs rather than their stomachs or sides (Keens & Gemmill, 2008). Among the reasons given for prone sleeping being a high risk factor for SIDS are that it impairs the infant's arousal from sleep and restricts the infant's ability to swallow effectively (Keens & Gemmill, 2008). A recent study revealed that at 3 months,

developmental **connection**

Sleep. What are some sleep problems that children encounter in early childhood? Chapter 7, p. 212

sudden infant death syndrome (SIDS) A condition that occurs when an infant stops breathing, usually during the night, and suddenly dies without an apparent cause.

26 percent of U.S. mothers did not use the recommended supine position for their infants' nighttime sleep (Hauck & others, 2008).

In addition to sleeping in a prone position, researchers have found that the following are risk factors for SIDS:

- SIDS is less likely to occur in infants who use a pacifier when they go to sleep (Li & others, 2006).
- Low birth weight infants are 5 to 10 times more likely to die of SIDS than are their normal-weight counterparts (Horne & others, 2002).
- Infants whose siblings have died of SIDS are two to four times as likely to die of it (Lenoir, Mallet, & Calenda, 2000).
- Six percent of infants with *sleep apnea,* a temporary cessation of breathing in which the airway is completely blocked, usually for 10 seconds or longer, die of SIDS (McNamara & Sullivan, 2000).
- African American and Eskimo infants are four to six times more likely than all others to die of SIDS (Ige & Shelton, 2004; Kitsantas & Gaffney, 2010).
- SIDS is more common in lower socioeconomic groups (Mitchell & others, 2000).
- SIDS is more common in infants who are passively exposed to cigarette smoke (Shea & Steiner, 2008).
- SIDS is more common if infants sleep in soft bedding (McGarvey & others, 2006).
- SIDS is less common when infants sleep in a bedroom with a fan. A recent study revealed that sleeping in a bedroom with a fan lowers the risk of SIDS by 70 percent (Coleman-Phox, Odouli, & Li, 2008).
- SIDS occurs more often in infants with abnormal brain stem functioning involving the neurotransmitter serotonin (Machaalani & Waters, 2008).

Is this a good sleep position for infants? Why or why not?

NUTRITION

From birth to 1 year of age, human infants nearly triple their weight and increase their length by 50 percent. What do they need to sustain this growth?

Nutritional Needs and Eating Behavior Individual differences among infants in terms of their nutrient reserves, body composition, growth rates, and activity patterns make defining actual nutrient needs difficult (Schiff, 2011; Wardlaw & Smith, 2011). However, because parents need guidelines, nutritionists recommend that infants consume approximately 50 calories per day for each pound they weigh—more than twice an adult's requirement per pound.

A number of developmental changes involving eating characterize the infant's first year (Black & Hurley, 2007). As infants' motor skills improve, they change from using suck-and-swallow movements with breast milk or formula to chew-and-swallow movements with semisolid and then more complex foods. As their fine motor control improves in the first year, they transition from being fed by others toward self-feeding. "By the end of the first year of life, children can sit independently, can chew and swallow a range of textures, are learning to feed themselves, and are making the transition to the family diet and meal patterns" (Black & Hurley, 2007, p. 1). At this point, infants need to have a diet that includes a variety of foods—especially fruits and vegetables.

Caregivers play very important roles in infants' early development of eating patterns (Black & others, 2009). Caregivers who are not sensitive to developmental changes in infants' nutritional needs, neglectful caregivers, and conditions of poverty can contribute to the development of eating problems in infants (Black & Lozoff, 2008).

STAGE
2
from about 6 months
Tender Sweet Carrots

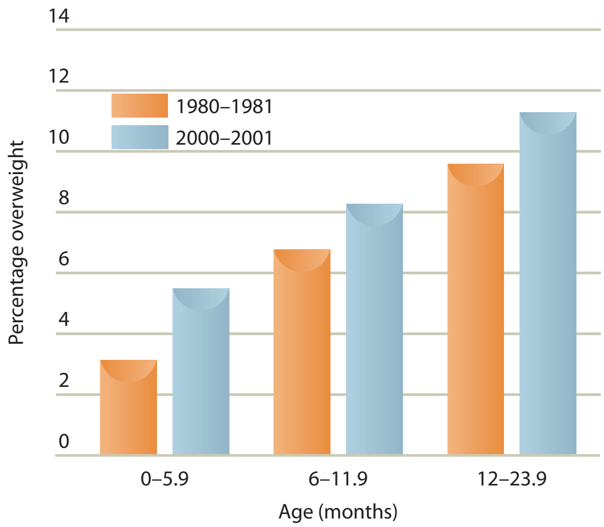


FIGURE **4.11**

PERCENTAGE OF OVERWEIGHT U.S. INFANTS IN 1980–1981 AND 2000–2001. Note: Infants above the 95th percentile for their age and gender on a weight-for-height index were categorized as overweight.

A national study of more than 3,000 randomly selected 4- to 24-month-olds documented that many U.S. parents aren't feeding their babies enough fruits and vegetables, but are feeding them too much junk food (Fox & others, 2004). Up to one-third of the babies ate no vegetables and fruit but frequently ate French fries, and almost half of the 7- to 8-month-old babies were fed desserts, sweets, or sweetened drinks. By 15 months, French fries were the most common vegetable the babies ate.

Such poor dietary patterns early in development can result in more infants being overweight (Black & others, 2009; Hesketh & Campbell, 2010). One analysis revealed that in 1980, 3.4 percent of U.S. babies less than 6 months old were overweight, a percentage that increased to 5.9 percent in 2001 (Kim & others, 2006). As shown in Figure 4.11, as younger infants become older infants, an even greater percentage are overweight. Also in this study, in addition to the 5.9 percent of infants less than 6 months old who were overweight in 2001, another 11 percent were categorized as at risk for being overweight. In this study, infants were categorized as overweight if they were above the 95th percentile for their age and gender on a weight-for-height index; they were labeled at risk for being overweight if they were between the 85th and 95th percentile.

In addition to eating too many French fries, sweetened drinks, and desserts, are there other factors that might explain this increase in overweight U.S. infants? A mother's weight gain during pregnancy and a mother's own high weight before pregnancy may be factors (McGuire, Dyson, & Renfrew, 2010; Murray & McKinney, 2010). One important factor likely is whether an infant is breast fed or bottle fed. Breast fed infants have lower rates of weight gain than bottle fed infants by school age, and it is estimated that breast feeding reduces the risk of obesity by approximately 20 percent (Li & others, 2007).

Breast Versus Bottle Feeding For the first four to six months of life, human milk or an alternative formula is the baby's source of nutrients and energy. For years, debate has focused on whether breast feeding is better for the infant than bottle feeding. The growing consensus is that breast feeding is better for the baby's health (Walker, 2010; Wilson, 2010). Since the 1970s, breast feeding by U.S. mothers has soared (see Figure 4.12). In 2004 more than two-thirds of U.S. mothers breast fed their newborns, and more than a third breast fed their 6-month-olds. The American Academy of Pediatrics (AAP) and the American Dietetic Association strongly endorse breast feeding throughout the infant's first year (AAP Work Group on Breastfeeding, 1997; James & Dobson, 2005).

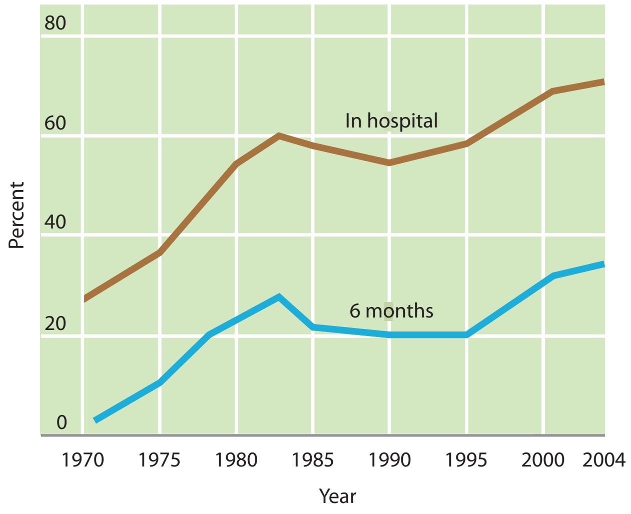


FIGURE **4.12**

TRENDS IN BREAST FEEDING IN THE UNITED STATES: 1970–2004

What are some of the benefits of breast feeding? The following conclusions have been reached based on the current state for research:

Outcomes for Child

- *Gastrointestinal infections.* Breast-fed infants have fewer gastrointestinal infections (Garofalo, 2010; Pfluger & others, 2010).
- *Lower respiratory tract infections.* Breast-fed infants have fewer lower respiratory tract infections (Ip & others, 2007).
- *Allergies.* A recent research review by the American Academy of Pediatrics indicated that there is no evidence that breast feeding reduces the risk of allergies in children (Greer & others, 2008). The research review also concluded that modest evidence exists for feeding hypoallergenic formulas to susceptible babies if they are not solely breast fed.
- *Asthma.* The recent research review by the American Academy of Pediatrics concluded that exclusive breast feeding for three months protects against wheezing in babies, but whether it prevents asthma in older children is unclear (Greer & others, 2008).

- *Otitis media.* Breast-fed infants are less likely to develop this middle ear infection (Pelton & Leibovitz, 2009).
- *Atopic dermatitis.* Breast-fed babies are less likely to have this chronic inflammation of the skin (Snijders & others, 2007). The recent research review by the American Academy of Pediatrics also concluded that for infants with a family history of allergies, breast feeding exclusively for at least four months is linked to a lower risk of skin rashes (Greer & others, 2008).
- *Overweight and obesity.* Consistent evidence indicates that breast-fed infants are less likely to become overweight or obese in childhood, adolescence, and adulthood (Lamb & others, 2010).
- *Diabetes.* Breast-fed infants are less likely to develop type 1 diabetes in childhood (Ping & Hagopian, 2006) and type 2 diabetes in adulthood (Villegas & others, 2008).
- *SIDS.* Breast-fed infants are less likely to experience SIDS (Stuebe, 2009).

In recent large-scale research reviews, no conclusive evidence for the benefits of breast feeding was found for children's cognitive development and cardiovascular system (Agency for Healthcare Research and Quality, 2007; Ip & others, 2009).

Outcomes for Mother

- *Breast cancer.* Consistent evidence indicates a lower incidence of breast cancer in women who breast feed their infants (Akbari & others, 2010).
- *Ovarian cancer.* Evidence also reveals a reduction in ovarian cancer in women who breast feed their infants (Stuebe & Schwartz, 2010).
- *Type 2 diabetes.* Some evidence suggests a small reduction in type 2 diabetes in women who breast feed their infants (Stuebe & Schwartz, 2010).

Human milk or an alternative formula is a baby's source of nutrients for the first four to six months. The growing consensus is that breast feeding is better for the baby's health, although controversy still swirls about the issue of breast feeding versus bottle feeding. *Why is breast feeding strongly recommended by pediatricians?*

In recent large-scale research reviews, no conclusive evidence could be found for the maternal benefits of breast feeding on return to prepregnancy weight, osteoporosis, and postpartum depression (Agency for Healthcare Research and Quality, 2007; Ip & others, 2009). However, a recent study revealed that women who breast fed their infants had a lower incidence of metabolic syndrome (a disorder characterized by obesity, hypertension, and insulin resistance) in midlife (Ram & others, 2008).

Many health professionals have argued that breast feeding facilitates the development of an attachment bond between the mother and infant (Britton, Britton, & Gronwaldt, 2006; Wittig & Spatz, 2008). However, a recent research review found that the positive role of breast feeding on the mother-infant relationship is not supported by research (Jansen, de Weerth, & Riksen-Walraven, 2008). The review concluded that recommending breast feeding should not be based on its role in improving the mother-infant relationship but rather on its positive effects on infant and maternal health.

Which women are least likely to breast feed? They include mothers who work full-time outside of the home, mothers under age 25, mothers without a high school education, African American mothers, and mothers in low-income circumstances (Merewood & others, 2007). In one study of low-income mothers in Georgia, interventions (such as counseling focused on the benefits of breast feeding and the free loan of a breast pump) increased the incidence of breast feeding (Ahluwalia & others, 2000). Increasingly, mothers who return to work in the infant's first year of life use a breast pump to extract breast milk that can be stored for later feeding of the infant when the mother is not present.

A baby is the most complicated object made by unskilled labor.

—Anonymous

The AAP Work Group on Breastfeeding strongly endorses breast feeding throughout the first year of life (AAPWGB, 1997). Are there circumstances when mothers should not breast feed? Yes, a mother should not breast feed (1) when she is infected with HIV or some other infectious disease that can be transmitted through her milk, (2) if she has active tuberculosis, or (3) if she is taking any drug that may not be safe for the infant (Berlin, Paul, & Vesell, 2009; Buhimschi & Weiner, 2009; Gumbo & others, 2010).

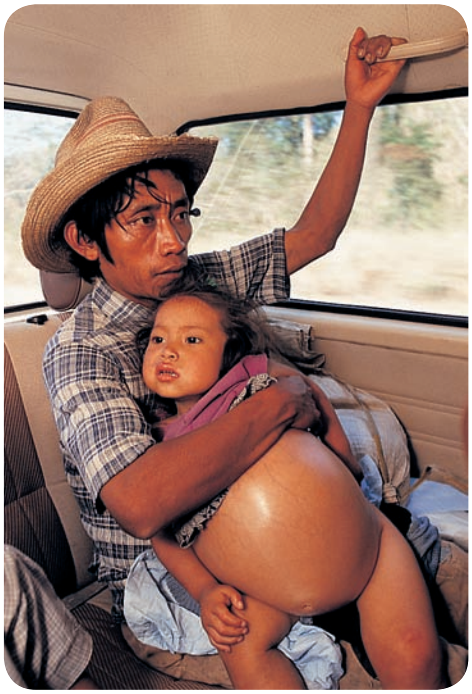
Some women cannot breast feed their infants because of physical difficulties; others feel guilty if they terminate breast feeding early. Mothers may also worry that they are depriving their infants of important emotional and psychological benefits if they bottle feed rather than breast feed. Some researchers have found, however, that there are no psychological differences between breast fed and bottle fed infants (Ferguson, Harwood, & Shannon, 1987; Young, 1990).

A further issue in interpreting the benefits of breast feeding was underscored in recent large-scale research reviews (Agency for Healthcare Quality and Research, 2007; Ip & others, 2009). While highlighting a number of breast feeding benefits for children and mothers, the report issued a caution about breast feeding research: None of the findings imply causality. Breast versus bottle feeding studies are correlational not experimental, and women who breast feed are wealthier, older, more educated, and likely more health-conscious than their bottle feeding counterparts, which could explain why breast-fed children are healthier.

developmental **connection**

Research Methods. How does a correlational study differ from an experimental study? Chapter 1, p. 34

Malnutrition in Infancy Early weaning of infants from breast milk to inadequate sources of nutrients, such as unsuitable and unsanitary cow's milk formula, can cause protein deficiency and malnutrition in infants (Lartey, 2008). Something that looks like milk but is not, usually a form of tapioca or rice, is also often substituted for breast milk. In many of the world's developing countries, mothers used to breast feed their infants for at least two years. To become more modern, they stopped breast feeding much earlier and replaced it with bottle feeding. Comparisons of breast fed and bottle fed infants in such countries as Afghanistan, Haiti, Ghana, and Chile document that the mortality rate of bottle fed infants is as much as five times that of breast-fed infants (Grant, 1997). However, as we saw in the opening story, a concern in developing countries is the increasing number of women who are HIV-positive and the fear that they will transmit this virus to their offspring (Oladokun, Brown, & Osinusi, 2010). Thus, breast feeding is more optimal for mothers and infants in developing countries, except for mothers with HIV/AIDS or those suspected of having HIV/AIDS.



This Honduran child has kwashiorkor. Notice the telltale sign of kwashiorkor—a greatly expanded abdomen. *What are some other characteristics of kwashiorkor?*

Two life-threatening conditions that can result from malnutrition are marasmus and kwashiorkor. **Marasmus** is caused by a severe protein-calorie deficiency and results in a wasting away of body tissues in the infant's first year. The infant becomes grossly underweight and his or her muscles atrophy. **Kwashiorkor,** caused by severe protein deficiency, usually appears between 1 and 3 years of age. Children with kwashiorkor sometimes appear to be well fed even though they are not because the disease can cause the child's abdomen and feet to swell with water. Kwashiorkor causes a child's vital organs to collect the nutrients that are present and deprive other parts of the body of them. The child's hair also becomes thin, brittle, and colorless, and the child's behavior often becomes listless.

Even if not fatal, severe and lengthy malnutrition is detrimental to physical, cognitive, and social development (Ruel, 2010; Victoria & others, 2010). A recent study of Indian children documented the negative influence of chronic maltnutrition on children's cognitive development. Children who had a history of chronic malnutrition performed more poorly on tests of attention and memory than their counterparts who were not malnourished (Kar, Rao, & Chandramouli, 2008). Another recent study of severely malnourished Bangladesh children revealed that standard nutritional care combined with a psychosocial intervention (group meetings with mothers and play sessions with infants, as well as six months of home visits) reduced the negative effects of malnutrition on 6- to 24-month-olds' cognitive

marasmus A wasting away of body tissues in the infant's first year, caused by severe protein-calorie deficiency.

kwashiorkor A condition caused by severe protein deficiency in which the child's abdomen and feet become swollen with water; usually appears between 1 to 3 years of age.

connecting development to life

Improving the Nutrition of Infants and Young Children Living in Low-Income Families

Poor nutrition is a special concern in the lives of infants from low-income families. To address this problem in the United States, the WIC (Women, Infants, and Children) program provides federal grants to states for healthy supplemental foods, health care referrals, and nutrition education for women from low-income families beginning in pregnancy, and to infants and young children up to 5 years of age who are at nutritional risk (Food & Nutrition Service, 2009; WIC New York, 2009). WIC serves approximately 7,500,000 participants in the United States. In 2009, WIC made changes in the program to promote breast feeding and provide more nutritious food (Food & Nutrition Service, 2009; WIC New York, 2009):

- *Increase breast feeding.* WIC staff are being trained in lactation counseling and in most programs, peer counseling services are available to pregnant women and new mothers.
- *Provide food lower in fat content.* Only 1 percent or skim milk is available for children 2 years of age and older and for women; low fat cheese and tofu are options.
- *Distribute food higher in fiber, and include more vegetables and fruits.* Vouchers provided to low-income families encourage the consumption of whole grain cereals and breads, as well as more vegetables and fruits.
- *Have food available that is more culturally appropriate.* For example, brown rice or whole grain tortillas can be substituted for whole grain breads; calcium-set tofu or calcium-fortified soy milk can be substituted for cow's milk.

Participants in the WIC program. *What are some of the changes that were implemented in the WIC program in 2009?*

An increasing research initiative is exploring ways to improve the WIC program and assess its influence on mothers, infants, and young children's nutrition and health (Black & others, 2009; Hannan & others, 2009; Heinig & others, 2009; Olson & others, 2010b; Sekhobo & others, 2010). In a recent study, a WIC program that introduced peer counseling services for pregnant women increased breast feeding initiation by 27 percent (Olson & others, 2010c). Another recent study found that entry in the first trimester of pregnancy to the WIC program in Rhode Island reduced maternal cigarette smoking (Brodsky, Viner-Brown, & Handler, 2009). Yet another study indicated that participating in WIC was linked with a lower risk for being overweight in young Mexican American children (Melgar-Quinonez & Kaiser, 2004).

Why would the WIC program likely advocate including lactation counseling as part of their services?

development, assessed with the Bayley Scales of Infant Development (Nahar & others, 2008).

Another study linked the diets of rural Guatemalan infants with their social development at the time they entered elementary school (Barrett, Radke-Yarrow, & Klein, 1982). Children whose mothers had been given nutritious supplements during pregnancy, and who themselves had been given more nutritious, high-calorie foods in their first two years of life, were more active, more involved, more helpful with their peers, less anxious, and happier than their counterparts who had not been given nutritional supplements. To read further about providing nutritional supplements to improve infants' and young children's nutrition, see *Connecting Development to Life*.

connecting with careers

T. Berry Brazelton, Pediatrician

T. Berry Brazelton is America's best-known pediatrician as a result of his numerous books, television appearances, and newspaper and magazine articles about parenting and children's health. He takes a family-centered approach to child development issues and communicates with parents in easy to understand ways.

Dr. Brazelton founded the Child Development Unit at Boston Children's Hospital and created the Brazelton Neonatal Behavioral Assessment Scale, a widely used measure of the newborn's health and well-being (which you read about in Chapter 3). He also has conducted a number of research studies on infants and children and has been president of the Society for Research in Child Development, a leading research organization.

T. Berry Brazelton, pediatrician, with a young child.

For more information about what pediatricians do, see page 47 in the Careers in Life-Span Development appendix.

dynamic systems theory The perspective on motor development that seeks to explain how motor behaviors are assembled for perceiving and acting.

Adequate early nutrition is an important aspect of healthy development (Schiff, 2011). In addition to sound nutrition, children need a nurturant, supportive environment (Floyd, Mimms, & Yelding, 2008). One individual who has stood out as an advocate of caring for children is T. Berry Brazelton, who is featured in *Connecting With Careers*.

Review *Connect* Reflect

LG1 Discuss physical growth and development in infancy.

Review

- What are cephalocaudal and proximodistal patterns?
- What changes in height and weight take place in infancy?
- What are some key features of the brain and its development in infancy?
- What changes occur in sleep during infancy?
- What are infants' nutritional needs?

Connect

- What types of brain research technology can be used to study infants that cannot be used to study them before they are born? Which can be used on adults but not infants? How might this affect our understanding of the human brain across the life span?

Reflect *Your Own Personal Journey of Life*

- What sleep and nutrition guidelines would you follow for enhancing the health and safety of your own infant?

2 Motor Development

LG2 Describe infants' motor development.

- The Dynamic Systems View
- Reflexes
- Gross Motor Skills
- Fine Motor Skills

As a newborn, Ramona, whom we met in the chapter opening, could suck, fling her arms, and tightly grip a finger placed in her tiny hand. Within just two years, she would be toddling around on her own, opening doors and jars as she explored her little world. Are her accomplishments inevitable? How do infants develop their motor skills, and which skills do they develop when?

Esther Thelen is shown conducting an experiment to discover how infants learn to control their arms to reach and grasp for objects. A computer device is used to monitor the infant's arm movements and to track muscle patterns. Thelen's research is conducted from a dynamic systems perspective. *What is the nature of this perspective?*

THE DYNAMIC SYSTEMS VIEW

Developmentalist Arnold Gesell (1934) thought his painstaking observations had revealed how people develop their motor skills. He had discovered that infants and children develop rolling, sitting, standing, and other motor skills in a fixed order and within specific time frames. These observations, said Gesell, show that motor development comes about through the unfolding of a genetic plan, or *maturation*.

Later studies, however, demonstrated that the sequence of developmental milestones is not as fixed as Gesell indicated and not due as much to heredity as Gesell argued (Adolph, Karasik, & Tamis-LeMonda, 2010; Soska, Adolph, & Johnson, 2010). In the last two decades, the study of motor development experienced a renaissance as psychologists developed new insights about *how* motor skills develop (Thelen & Smith, 1998, 2006). One increasingly influential theory is dynamic systems theory, proposed by Esther Thelen.

According to **dynamic systems theory,** infants assemble motor skills for perceiving and acting. Notice that perception and action are coupled according to this theory (Thelen & Smith, 2006). To develop motor skills, infants must perceive something in the environment that motivates them to act and use their perceptions to fine-tune their movements. Motor skills represent solutions to the infant's goals (Bertenthal, 2008).

How is a motor skill developed according to this theory? When infants are motivated to do something, they might create a new motor behavior. The new behavior is the result of many converging factors: the development of the nervous system, the body's physical properties and its possibilities for movement, the goal the child is motivated to reach, and the environmental support for the skill (von Hofsten, 2008). For example, babies learn to walk only when maturation of the nervous system allows them to control certain leg muscles, when their legs have grown enough to support their weight, and when they want to move.

Mastering a motor skill requires the infant's active efforts to coordinate several components of the skill. Infants explore and select possible solutions to the demands of a new task; they assemble adaptive patterns by modifying their current movement patterns. The first step occurs when the infant is motivated by a new challenge—such as the desire to cross a room—and gets into the "ballpark" of the task demands by taking a couple of stumbling steps. Then, the infant "tunes" these movements to make them smoother and more effective. The tuning is achieved through repeated cycles of action and perception of the consequences of that action. According to the dynamic systems view, even universal milestones, such as crawling, reaching, and walking, are learned through this process of adaptation: Infants

How might dynamic systems theory explain the development of learning to walk?

modulate their movement patterns to fit a new task by exploring and selecting possible configurations (Adolph, Karasik, & Tamis-LeMonda, 2010; Thelen & Smith, 2006).

To see how dynamic systems theory explains motor behavior, imagine that you offer a new toy to a baby named Gabriel (Thelen & others, 1993). There is no exact program that can tell Gabriel ahead of time how to move his arm and hand and fingers to grasp the toy. Gabriel must adapt to his goal—grasping the toy—and the context. From his sitting position, he must make split-second adjustments to extend his arm, holding his body steady so that his arm and torso don't plow into the toy. Muscles in his arm and shoulder contract and stretch in a host of combinations, exerting a variety of forces. He improvises a way to reach out with one arm and wrap his fingers around the toy.

Thus, according to dynamic systems theory, motor development is not a passive process in which genes dictate the unfolding of a sequence of skills over time. Rather, the infant actively puts together a skill to achieve a goal within the constraints set by the infant's body and environment. Nature and nurture, the infant and the environment, are all working together as part of an ever-changing system.

As we examine the course of motor development, we will describe how dynamic systems theory applies to some specific skills. First, though, let's examine how the story of motor development begins with reflexes.

Moro reflex

Grasping reflex

FIGURE **4.13**

NEWBORN REFLEXES

REFLEXES

The newborn is not completely helpless. Among other things, it has some basic reflexes. For example, the newborn automatically holds its breath and contracts its throat to keep water out. **Reflexes** are built-in reactions to stimuli; they govern the newborn's movements, which are automatic and beyond the newborn's control. Reflexes are genetically carried survival mechanisms. They allow infants to respond adaptively to their environment before they have had the opportunity to learn.

The rooting and sucking reflexes are important examples. Both have survival value for newborn mammals, who must find a mother's breast to obtain nourishment. The **rooting reflex** occurs when the infant's cheek is stroked or the side of the mouth is touched. In response, the infant turns its head toward the side that was touched in an apparent effort to find something to suck. The **sucking reflex** occurs when newborns automatically suck an object placed in their mouth. This reflex enables newborns to get nourishment before they have associated a nipple with food and also serves as a self-soothing or self-regulating mechanism.

Another example is the **Moro reflex,** which occurs in response to a sudden, intense noise or movement (see Figure 4.13). When startled, the newborn arches its back, throws back its head, and flings out its arms and legs. Then the newborn rapidly closes its arms and legs. The Moro reflex is believed to be a way of grabbing for support while falling; it would have had survival value for our primate ancestors.

Some reflexes—coughing, sneezing, blinking, shivering, and yawning, for example—persist throughout life. They are as important for the adult as they are for the infant. Other reflexes, though, disappear several months following birth, as the infant's brain matures, and voluntary control over many behaviors develops (Pedroso, 2008). The rooting and Moro reflexes, for example, tend to disappear when the infant is 3 to 4 months old.

The movements of some reflexes eventually become incorporated into more complex, voluntary actions. One important example is the **grasping reflex,** which occurs when something touches the infant's palms (see Figure 4.13). The infant responds by grasping tightly. By the end of the third month, the grasping reflex diminishes, and the infant shows a more voluntary grasp. As its motor development becomes smoother, the infant will grasp objects, carefully manipulate them, and explore their qualities.

Although reflexes are automatic and inborn, differences in reflexive behavior are soon apparent. For example, the sucking capabilities of newborns vary considerably.

reflexes Built-in reactions to stimuli that govern the newborn's movements, which are automatic and beyond the newborn's control.

rooting reflex A newborn's built-in reaction that occurs when the infant's cheek is stroked or the side of the mouth is touched. In response, the infant turns his or her head toward the side that was touched, in an apparent effort to find something to suck.

sucking reflex A newborn's built-in reaction to automatically suck an object placed in its mouth. The sucking reflex enables the infant to get nourishment before he or she has associated a nipple with food and also serves as a self-soothing or self-regulating mechanism.

Moro reflex A neonatal startle response that occurs in reaction to a sudden, intense noise or movement. When startled, the newborn arches its back, throws its head back, and flings out its arms and legs. Then the newborn rapidly closes its arms and legs to the center of the body.

Some newborns are efficient at forceful sucking and obtaining milk; others are not as adept and get tired before they are full. Most infants take several weeks to establish a sucking style that is coordinated with the way the mother is holding the infant, the way milk is coming out of the bottle or breast, and the infant's temperament (Blass, 2008).

Pediatrician T. Berry Brazelton (1956) observed how infants' sucking changed as they grew older. Over 85 percent of the infants engaged in considerable sucking behavior unrelated to feeding. They sucked their finger, their fists, and pacifiers. By the age of 1 year, most had stopped the sucking behavior, but as many as 40 percent of children continue to suck their thumbs after they have started school (Kessen, Haith, & Salapatek, 1970). Most developmentalists do not attach a great deal of significance to this behavior.

GROSS MOTOR SKILLS

Ask any parents about their baby, and sooner or later you are likely to hear about one or more motor milestones, such as "Cassandra just learned to crawl," "Jesse is finally sitting alone," or "Angela took her first step last week." Parents proudly announce such milestones as their children transform themselves from babies unable to lift their heads to toddlers who grab things off the grocery store shelf, chase a cat, and participate actively in the family's social life (Thelen, 2000). These milestones are examples of **gross motor skills,** which are skills that involve large-muscle activities, such as moving one's arms and walking.

What are some developmental changes in posture during infancy?

The Development of Posture

How do gross motor skills develop? As a foundation, these skills require postural control (Thelen & Smith, 2006). For example, to track moving objects, you must be able to control your head in order to stabilize your gaze; before you can walk, you must be able to balance on one leg.

Posture is more than just holding still and straight. Posture is a dynamic process that is linked with sensory information in the skin, joints, and muscles, which tell us where we are in space; in vestibular organs in the inner ear that regulate balance and equilibrium; and in vision and hearing (Thelen & Smith, 2006).

Newborn infants cannot voluntarily control their posture. Within a few weeks, though, they can hold their heads erect, and soon they can lift their heads while prone. By 2 months of age, babies can sit while supported on a lap or an infant seat, but they cannot sit independently until they are 6 or 7 months of age. Standing also develops gradually during the first year of life. By about 8 to 9 months of age, infants usually learn to pull themselves up and hold on to a chair, and they often can stand alone by about 10 to 12 months of age.

Learning to Walk

Locomotion and postural control are closely linked, especially in walking upright (Adolph & Joh, 2009; Adolph & others, 2009). To walk upright, the baby must be able both to balance on one leg as the other is swung forward and to shift the weight from one leg to the other.

Even young infants can make the alternating leg movements that are needed for walking. The neural pathways that control leg alternation are in place from a very early age, possibly even at birth or before. A recent study found that 3-day-old infants adapted their stepping pattern to visual input (Barbu-Roth & others, 2009). In this study, the very young infants took more steps when they saw a visual treadmill moving beneath their feet than their counterparts who saw a stationary image or an image that rotated. This study also illustrates the key concept of the coupling of perception and action in dynamic systems theory. Infants also engage in frequent alternating kicking movements throughout the first six months of life when they are lying on their backs. Also when 1- to 2-month-olds are given support with their feet in contact with a motorized treadmill, they show well-coordinated, alternating steps.

grasping reflex A neonatal reflex that occurs when something touches the infant's palms. The infant responds by grasping tightly.

gross motor skills Motor skills that involve large-muscle activities, such as walking.

Newly crawling infant

Experienced walker

FIGURE **4.14**

THE ROLE OF EXPERIENCE IN CRAWLING AND WALKING INFANTS' JUDGMENTS OF WHETHER TO GO DOWN A SLOPE. Karen Adolph (1997) found that locomotor experience rather than age was the primary predictor of adaptive responding on slopes of varying steepness. Newly crawling and walking infants could not judge the safety of the various slopes. With experience, they learned to avoid slopes where they would fall. When expert crawlers began to walk, they again made mistakes and fell, even though they had judged the same slope accurately when crawling. Adolph referred to this as the *specificity of learning* because it does not transfer across crawling and walking.

Despite these early abilities, most infants do not learn to walk until about the time of their first birthday. If infants can produce forward stepping movements so early, why does it take them so long to learn to walk? The key skills in learning to walk appear to be stabilizing balance on one leg long enough to swing the other forward and shifting the weight without falling. These are difficult biomechanical problems to solve, and it takes infants about a year to do it.

When infants learn to walk, they typically take small steps because of their limited balance control and strength. However, a recent study revealed that infants occasionally take a few large steps that even exceed their leg length and these large steps indicate increased balance and strength (Badaly & Adolph, 2008).

In learning to locomote, infants learn what kinds of places and surfaces are safe for locomotion (Adolph & Joh, 2009; Adolph & others, 2009). Karen Adolph (1997) investigated how experienced and inexperienced crawling infants and walking infants go down steep slopes (see Figure 4.14). Newly crawling infants, who averaged about 8½ months in age, rather indiscriminately went down the steep slopes, often falling in the process (with their mothers next to the slope to catch them). After weeks of practice, the crawling babies became more adept at judging which slopes were too steep to crawl down and which ones they could navigate safely. New walkers also could not judge the safety of the slopes, but experienced walkers accurately matched their skills with the steepness of the slopes. They rarely fell downhill, either refusing to go down the steep slopes or going down backward in a cautious manner. Experienced walkers perceptually assessed the situation—looking, swaying, touching, and thinking before they moved down the slope. With experience, both the crawlers and the walkers learned to avoid the risky slopes where they would fall, integrating perceptual information with the development of a new motor behavior. In this research, we again see the importance of perceptual-motor coupling in the development of motor skills. Thus, practice is very important in the development of new motor skills (Adolph & Joh 2009; Adolph, Karasik, & Tamis-LeMonda, 2010; Adolph & others, 2009).

Practice is especially important in learning to walk (Adolph & Joh, 2009). "Thousands of daily walking steps, each step slightly different from the last because of variations in the terrain and the continually varying biomechanical constraints on the body, may help infants to identify the relevant" combination of strength and balance required to improve their walking skills (Adolph, Vereijken, & Shrout, 2003, p. 495).

The First Year: Motor Development Milestones and Variations Figure 4.15 summarizes important accomplishments in gross motor skills during the first year, culminating in the ability to walk easily. The timing of these milestones, especially the later ones, may vary by as much as two to four months, and experiences can modify the onset of these accomplishments (Eaton, 2008). For example, since 1992, when pediatricians began recommending that parents place their babies on their backs when they sleep, fewer babies crawled, and those who did crawled later (Davis & others, 1998). Also, some infants do not follow the standard sequence of motor accomplishments. For example, many American infants never crawl on their belly or on their hands and knees. They may discover an idiosyncratic form of locomotion before walking, such as rolling, or they might never locomote until they get upright (Adolph & Joh, 2009). In the African Mali tribe, most infants do not crawl (Bril, 1999).

According to Karen Adolph and Sarah Berger (2005), "the old-fashioned view that growth and motor development reflect merely the age-related output of maturation is, at best, incomplete. Rather, infants acquire new skills with the help of their caregivers in a real-world environment of objects, surfaces, and planes."

Development in the Second Year The motor accomplishments of the first year bring increasing independence, allowing infants to explore their environment more extensively and to initiate interaction with others more readily. In the second year of life, toddlers become more motorically skilled and mobile. Motor activity during

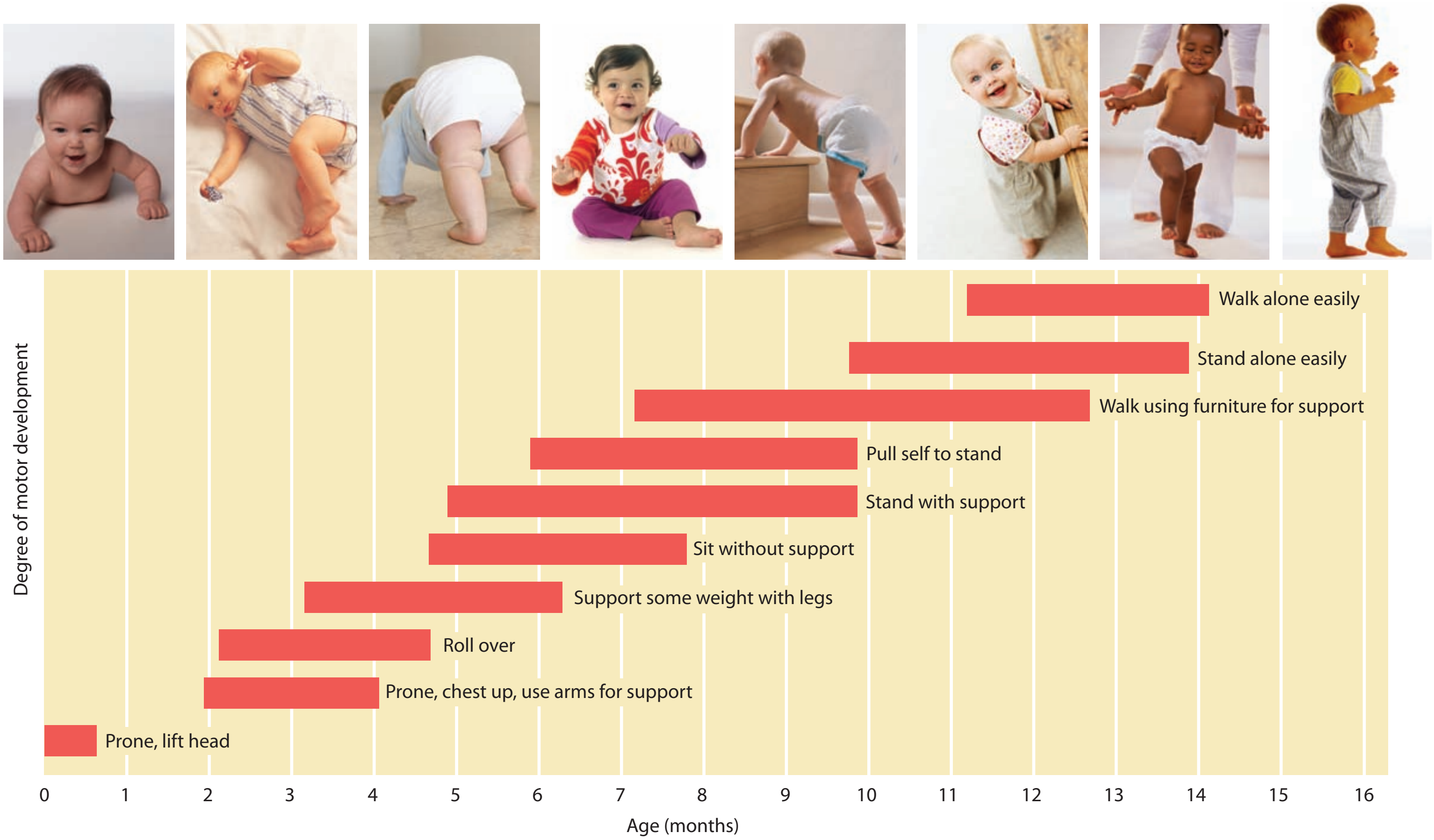


FIGURE **4.15**

MILESTONES IN GROSS MOTOR DEVELOPMENT. The horizontal red bars indicate the range in which most infants reach various milestones in gross motor development.

the second year is vital to the child's competent development, and few restrictions, except for safety, should be placed on their adventures.

By 13 to 18 months, toddlers can pull a toy attached to a string and use their hands and legs to climb up a number of steps. By 18 to 24 months, toddlers can walk quickly or run stiffly for a short distance, balance on their feet in a squat position while playing with objects on the floor, walk backward without losing their balance, stand and kick a ball without falling, stand and throw a ball, and jump in place.

Can parents give their babies a head start on becoming physically fit and physically talented through structured exercise classes? Most infancy experts recommend against structured exercise classes for babies. But there are other ways of guiding infants' motor development.

Caregivers in some cultures handle babies vigorously and this might advance motor development. Mothers in developing countries, for example, tend to stimulate their infants' motor skills more than mothers in more modern countries (Hopkins, 1991). In many African, Indian, and Caribbean cultures, mothers massage and stretch their infants during daily baths (Adolph, Karasik, & Tamis-LeMonda, 2010). Jamaican and Mali mothers regularly massage their infants and stretch their arms and legs (Adolph, Karasik, & Tamis-LeMonda, 2010). Mothers in the Gusii culture of Kenya also encourage vigorous movement in their babies (Hopkins & Westra, 1988).

Do these cultural variations make a difference in the infant's motor development? When caregivers provide babies with physical guidance by physically handling them in special ways (such as stroking, massaging, or stretching) or by giving them opportunities for exercise, the infants often reach motor milestones earlier than infants whose caregivers have not provided these activities (Adolph, Karasik, & Tamis-LeMonda, 2010). For example, Jamaican mothers expect their infants to sit and walk alone two to three months earlier than English mothers do (Hopkins & Westra, 1990).

A baby is an angel whose wings decrease as his legs increase.

—French Proverb

(*Left*) In the Algonquin culture in Quebec, Canada, babies are strapped to a cradle board for much of their infancy. (*Right*) In Jamaica, mothers massage and stretch their infants' arms and legs. *To what extent do cultural variations in the activity infants engage in influence the time at which they reach motor milestones?*

A young girl using a pincer grip to pick up puzzle pieces.

Nonetheless, even when infants' motor activity is restricted, many infants still reach the milestones of motor development at a normal age. For example, Algonquin infants in Quebec, Canada, spend much of their first year strapped to a cradle board. Despite their inactivity, these infants still sit up, crawl, and walk within an age range similar to that of infants in cultures who have had much greater opportunity for activity.

FINE MOTOR SKILLS

Whereas gross motor skills involve large muscle activity, **fine motor skills** involve finely tuned movements. Grasping a toy, using a spoon, buttoning a shirt, or anything that requires finger dexterity demonstrates fine motor skills. Infants have hardly any control over fine motor skills at birth, but newborns do have many components of what will become finely coordinated arm, hand, and finger movements.

The onset of reaching and grasping marks a significant achievement in infants' ability to interact with their surroundings (van Hof, van der Kamp, & Savelsbergh, 2008). During the first two years of life, infants refine how they reach and grasp (Barrett & Needham, 2008; Needham, 2009). Initially, infants reach by moving their shoulders and elbows crudely, swinging toward an object. Later, when infants reach for an object they move their wrists, rotate their hands, and coordinate their thumb and forefinger. Infants do not have to see their own hands in order to reach for an object (Clifton & others, 1993). Cues from muscles, tendons, and joints, not sight of the limb, guide reaching by 4-month-old infants.

Infants refine their ability to grasp objects by developing two types of grasps. Initially, infants grip with the whole hand, which is called the *palmer grasp*. Later, toward the end of the first year, infants also grasp small objects with their thumb and forefinger, which is called the *pincer grip*. Their grasping system is very flexible. They vary their grip on an object depending on its size, shape, and texture, as well as the size of their own hands relative to the object's size. Infants grip small objects with their thumb and forefinger (and sometimes their middle finger too), whereas they grip large objects with all of the fingers of one hand or both hands.

Perceptual-motor coupling is necessary for the infant to coordinate grasping (Barrett, Traupman, & Needham, 2008). Which perceptual system the infant is most likely to use in coordinating grasping varies with age. Four-month-old infants rely greatly on touch to determine how they will grip an object; 8-month-olds are more likely to use vision as a guide (Newell & others, 1989). This developmental change is efficient because vision lets infants preshape their hands as they reach for an object.

Experience plays a role in reaching and grasping. In one study, three-month-old infants participated in play sessions wearing "sticky mittens"—"mittens with palms that stuck to the edges of toys and allowed the infants to pick up the toys" (Needham, Barrett, & Peterman, 2002, p. 279) (see Figure 4.16). Infants who participated in sessions with the mittens grasped and manipulated objects earlier in their development than a control group of infants who did not receive the "mitten" experience.

FIGURE **4.16**

INFANTS' USE OF "STICKY MITTENS" TO EXPLORE OBJECTS. Amy Needham and her colleagues (2002) found that "sticky mittens" enhanced young infants' object exploration skills.

fine motor skills Motor skills that involve more finely tuned movements, such as finger dexterity.

sensation The product of the interaction between information and the sensory receptors—the eyes, ears, tongue, nostrils, and skin.

The experienced infants looked at the objects longer, swatted at them more during visual contact, and were more likely to mouth the objects.

Just as infants need to exercise their gross motor skills, they also need to exercise their fine motor skills (Barrett, Davis, & Needham, 2007; Needham, 2009). Especially when they can manage a pincer grip, infants delight in picking up small objects. Many develop the pincer grip and begin to crawl at about the same time, and infants at this time pick up virtually everything in sight, especially on the floor, and put the objects in their mouth. Thus, parents need to be vigilant in regularly monitoring what objects are within the infant's reach (Keen, 2005).

Review *Connect* Reflect

LG2 Describe infants' motor development.

Review

- What is the dynamic systems view?
- What are some reflexes that infants have?
- How do gross motor skills develop in infancy?
- How do fine motor skills develop in infancy?

Connect

- What are the differences between the grasping reflex present at birth and the fine motor grasping skills an infant develops between 4 and 12 months of age?

Reflect *Your Own Personal Journey of Life*

- Think of a motor skill that you perform. How would dynamic systems theory explain your motor skill performance?

3 Sensory and Perceptual Development

LG3 Summarize the course of sensory and perceptual development in infancy.

- What Are Sensation and Perception?
- The Ecological View
- Visual Perception
- Other Senses
- Intermodal Perception
- Nature, Nurture, and Perceptual Development
- Perceptual-Motor Coupling

How do sensations and perceptions develop? Can a newborn see? If so, what can it perceive? What about the other senses—hearing, smell, taste, and touch? What are they like in the newborn, and how do they develop? Can an infant put together information from two modalities, such as sight and sound? These are among the intriguing questions that we will explore in this section.

> The experiences of the first three years of life are almost entirely lost to us, and when we attempt to enter into a small child's world, we come as foreigners who have forgotten the landscape and no longer speak the native tongue.
>
> —Selma Fraiberg
>
> *Developmentalist and Child Advocate, 20th Century*

WHAT ARE SENSATION AND PERCEPTION?

How does a newborn know that her mother's skin is soft rather than rough? How does a 5-year-old know what color his hair is? Infants and children "know" these things as a result of information that comes through the senses. Without vision, hearing, touch, taste, and smell, we would be isolated from the world; we would live in dark silence, a tasteless, colorless, feelingless void.

Sensation occurs when information interacts with sensory *receptors*—the eyes, ears, tongue, nostrils, and skin. The sensation of hearing occurs when waves of pulsating air are collected by the outer ear and transmitted through the bones of the inner ear to the auditory nerve. The sensation of vision occurs as rays of light contact the eyes, become focused on the retina, and are transmitted by the optic nerve to the visual centers of the brain.

Perception is the interpretation of what is sensed. The air waves that contact the ears might be interpreted as noise or as musical sounds, for example. The physical energy transmitted to the retina of the eye might be interpreted as a particular color, pattern, or shape, depending on how it is perceived.

How would you use the Gibsons' ecological theory of perception and the concept of affordance to explain the role that perception is playing in this toddler's activity?

THE ECOLOGICAL VIEW

For the past several decades, much of the research on perceptual development in infancy has been guided by the ecological view of Eleanor and James J. Gibson (E. J. Gibson, 1969, 1989, 2001; J. J. Gibson, 1966, 1979). They argue that we do not have to take bits and pieces of data from sensations and build up representations of the world in our minds. Instead, our perceptual system can select from the rich information that the environment itself provides.

According to the Gibsons' **ecological view,** we directly perceive information that exists in the world around us. The view is called *ecological* "because it connects perceptual capabilities to information available in the world of the perceiver" (Kellman & Arterberry, 2006, p. 112). Thus, perception brings us into contact with the environment in order to interact with and adapt to it. Perception is designed for action. Perception gives people such information as when to duck, when to turn their bodies through a narrow passageway, and when to put their hands up to catch something.

In the Gibsons' view, objects have **affordances,** which are opportunities for interaction offered by objects that fit within our capabilities to perform activities. A pot may afford you something to cook with, and it may afford a toddler something to bang. Adults typically know when a chair is appropriate for sitting, when a surface is safe for walking, or when an object is within reach. We directly and accurately perceive these affordances by sensing information from the environment—the light or sound reflecting from the surfaces of the world—and from our own bodies through muscle receptors, joint receptors, and skin receptors, for example.

An important developmental question is: What affordances can infants or children detect and use? In one study, for example, when babies who could walk were faced with a squishy waterbed, they stopped and explored it, then chose to crawl rather than walk across it (Gibson & others, 1987). They combined perception and action to adapt to the demands of the task.

Similarly, as we described earlier in the section on motor development, infants who were just learning to crawl or just learning to walk were less cautious when confronted with a steep slope than experienced crawlers or walkers were (Adolph, 1997). The more experienced crawlers and walkers perceived that a slope *affords* the possibility for not only faster locomotion but also for falling. Again, infants coupled perception and action to make a decision about what do in their environment. Through perceptual development, children become more efficient at discovering and using affordances.

Studying infants' perceptions has not been an easy task. For instance, if newborns have limited communication abilities and are unable to verbalize what they are seeing, hearing, smelling, and so on, how can we study their perception? *Connecting Through Research* describes some of the ingenious ways researchers study infants' perceptions.

perception The interpretation of what is sensed.

ecological view The view that perception functions to bring organisms in contact with the environment and to increase adaptation.

affordances Opportunities for interaction offered by objects that fit within our capabilities to perform functional activities.

visual preference method A method used to determine whether infants can distinguish one stimulus from another by measuring the length of time they attend to different stimuli.

habituation Decreased responsiveness to a stimulus after repeated presentations of the stimulus.

dishabituation Recovery of a habituated response after a change in stimulation.

connecting through research

How Can We Study Newborns' Perception?

The creature has poor motor coordination and can move itself only with great difficulty. Although it cries when uncomfortable, it uses few other vocalizations. In fact, it sleeps most of the time, about 16 to 17 hours a day. You are curious about this creature and want to know more about what it can do. You think to yourself, "I wonder if it can see. How could I find out?"

You obviously have a communication problem with the creature. You must devise a way that will allow the creature to "tell" you that it can see. While examining the creature one day, you make an interesting discovery. When you move an object horizontally in front of the creature, its eyes follow the object's movement.

The creature's head movement suggests that it has at least some vision. In case you haven't already guessed, the creature you have been reading about is the human infant, and the role you played is that of a researcher interested in devising techniques to learn about the infant's visual perception. After years of work, scientists have developed research methods and tools sophisticated enough to examine the subtle abilities of infants and to interpret their complex actions (Bendersky & Sullivan, 2007).

Visual Preference Method

Robert Fantz (1963) was a pioneer in this effort. Fantz made an important discovery that advanced the ability of researchers to investigate infants' visual perception: Infants look at different things for different lengths of time. Fantz placed an infant in a "looking chamber," which had two visual displays on the ceiling above the infant's head. An experimenter viewed the infant's eyes by looking through a peephole. If the infant was fixating on one of the displays, the experimenter could see the display's reflection in the infant's eyes. This allowed the experimenter to determine how long the infant looked at each display. Fantz (1963) found that infants only two days old look longer at patterned stimuli, such as faces and concentric circles, than at red, white, or yellow discs. Infants 2 to 3 weeks old preferred to look at patterns—a face, a piece of printed matter, or a bull's-eye—longer than at red, yellow, or white discs (see Figure 4.17). Fantz' research method—studying whether infants can distinguish one stimulus from another by measuring the length of time they attend to different stimuli—is referred to as the **visual preference method.**

Habituation and Dishabituation

Another way that researchers have studied infant perception is to present a stimulus (such as a sight or a sound) a number of times. If the infant decreases its response to the stimulus after several presentations, it indicates that the infant is no longer interested in looking at the stimulus. If the researcher now presents a new stimulus, the infant's response will recover—indicating the infant could discriminate between the old and new stimulus (Snyder & Torrence, 2008).

Habituation is the name given to decreased responsiveness to a stimulus after repeated presentations of the stimulus. **Dishabituation** is the recovery of a habituated response after a change in stimulation. Newborn infants can habituate to repeated sights, sounds, smells, or touches (Rovee-Collier, 2004). Among the measures researchers use in

(continued)

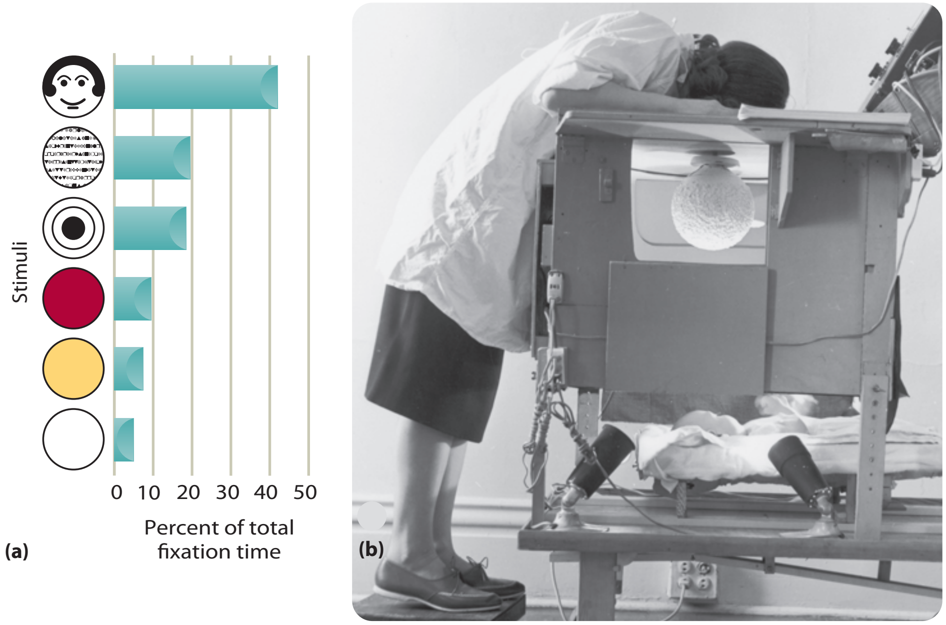


FIGURE **4.17**

FANTZ' EXPERIMENT ON INFANTS' VISUAL PERCEPTION. (*a*) Infants 2 to 3 weeks old preferred to look at some stimuli more than others. In Fantz' experiment, infants preferred to look at patterns rather than at color or brightness. For example, they looked longer at a face, a piece of printed matter, or a bull's-eye than at red, yellow, or white discs. (*b*) Fantz used a "looking chamber" to study infants' perception of stimuli.

connecting through research

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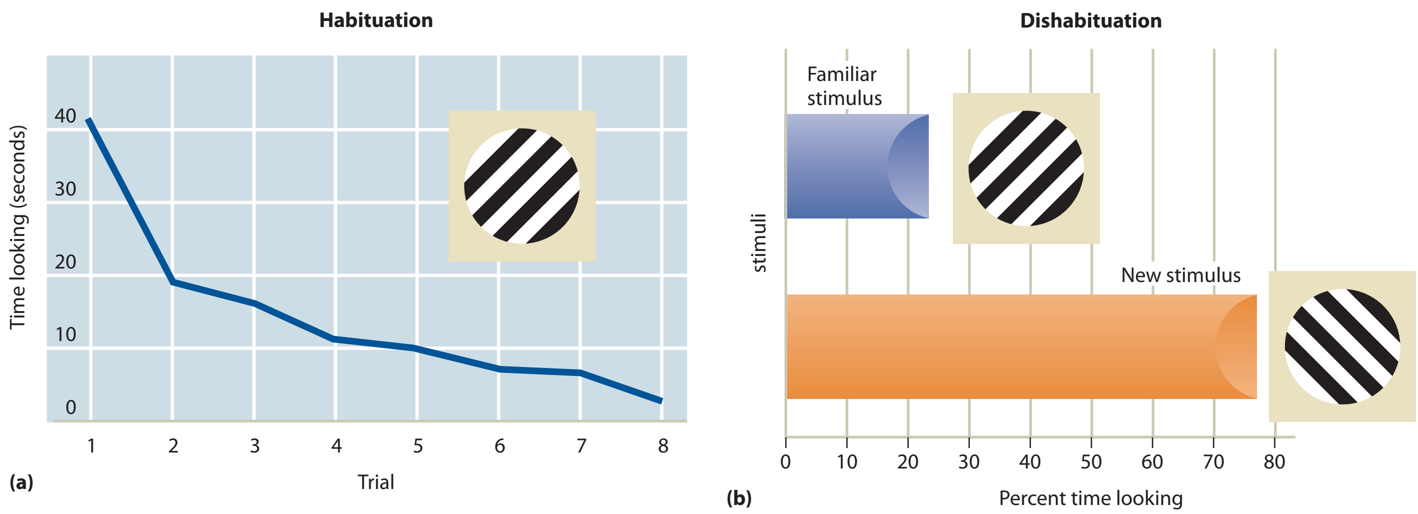


FIGURE **4.18**

HABITUATION AND DISHABITUATION. In the first part of one study (*a*), 7-hour-old newborns were shown a stimulus. As indicated, the newborns looked at it an average of 41 seconds when it was first presented to them (Slater, Morison, & Somers, 1988). Over seven more presentations of the stimulus, they looked at it less and less. In the second part of the study (*b*), infants were presented with both the familiar stimulus to which they had just become habituated and a new stimulus (which was rotated 90 degrees). The newborns looked at the new stimulus three times as much as the familiar stimulus.

habituation studies are sucking behavior (sucking stops when the young infant attends to a novel object), heart and respiration rates, and the length of time the infant looks at an object. Figure 4.18 shows the results of one study of habituation and dishabituation with newborns (Slater, Morison, & Somers, 1988).

High-Amplitude Sucking

To assess an infant's attention to sound, researchers often use a method called *high-amplitude sucking.* In this method, infants are given a nonnutritive nipple to suck, and the nipple is connected to "a sound generating system. Each suck causes a noise to be generated and the infant learns quickly that sucking brings about this noise. At first, babies suck frequently, so the noise occurs often. Then, gradually, they lose interest in hearing repetitions of the same noise and begin to suck less frequently. At this point, the experimenter changes the sound that is being generated. If the babies renew vigorous sucking, we infer that they have discriminated the sound change and are sucking more because they want to hear the interesting new sound" (Menn & Stoel-Gammon, 2009, p. 67).

FIGURE **4.19**

AN INFANT WEARING EYE-TRACKING HEADGEAR. Photo from Karen Adolph's labratory at New York University.

The Orienting Response and Tracking

A technique that can be used to determine if an infant can see or hear is the *orienting response,* which involves turning one's head toward a sight or sound. Another technique, *tracking,* consists of eye movements that follow (*track*) a moving object and can be used to evaluate an infant's early visual ability, or a startle response can be used to determine an infant's reaction to a noise (Bendersky & Sullivan, 2007). Researchers increasingly are using sophisticated eye-tracking equipment to improve understanding of infant perception (Johnson & Shuwairi, 2009). Figure 4.19 shows an infant wearing an eye-tracking

connecting through research

(continued)

headgear in a recent study on visually guided motor behavior and social interaction (Franchak & others, 2010).

Equipment

Technology can facilitate the use of most methods for investigating the infant's perceptual abilities. Video-recording equipment allows researchers to investigate elusive behaviors. High-speed computers make it possible to perform complex data analysis in minutes. Other equipment records respiration, heart rate, body movement, visual fixation, and sucking behavior, which provide clues to what the infant is perceiving. For example, some researchers use equipment that detects if a change in infants' respiration follows a change in the pitch of a sound. If so, it suggests that the infants heard the pitch change.

Scientists have had to be very creative when assessing the development of infants, discovering ways to "interview" them even though they cannot yet talk. Other segments of the population, such as adults who have suffered from a stroke, have trouble communicating verbally. What kinds of methods or equipment do you think researchers might use to evaluate their perception abilities?

VISUAL PERCEPTION

What do newborns see? How does visual perception develop in infancy?

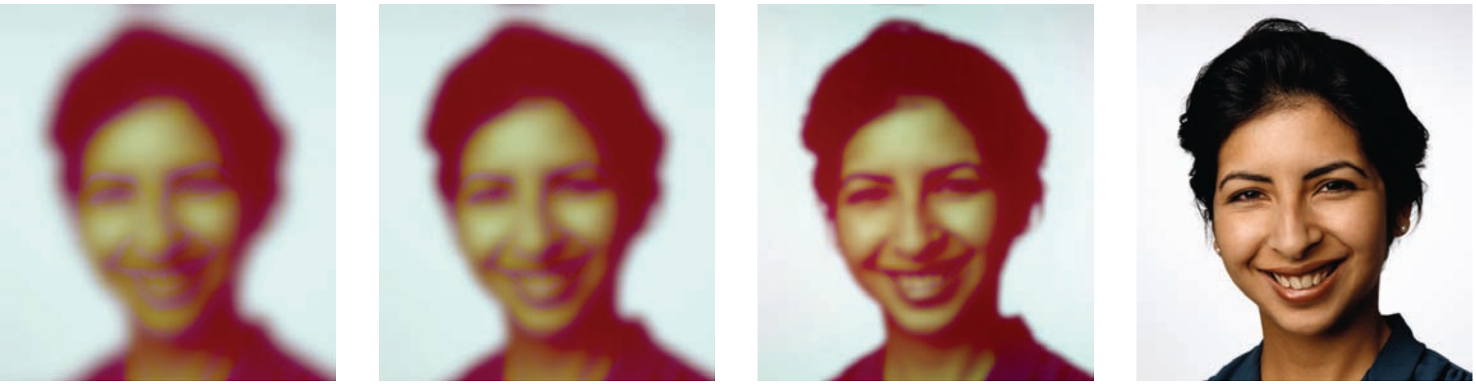
Visual Acuity and Human Faces Psychologist William James (1890/1950) called the newborn's perceptual world a "blooming, buzzing confusion." More than a century later, we can safely say that he was wrong (Slater, Field, & Hernandez-Reif, 2007). Even the newborn perceives a world with some order. That world, however, is far different from the one perceived by the toddler or the adult.

Just how well can infants see? At birth, the nerves and muscles and lens of the eye are still developing. As a result, newborns cannot see small things that are far away. The newborn's vision is estimated to be 20/240 on the well-known Snellen chart used for eye examinations, which means that a newborn can see at 20 feet what a normal adult can see at 240 feet (Aslin & Lathrop, 2008). In other words, an object 20 feet away is only as clear to the newborn as it would be if it were 240 feet away from an adult with normal vision (20/20). By 6 months of age, though, on *average* vision is 20/40 (Aslin & Lathrop, 2008).

Infants show an interest in human faces soon after birth (Cashon, 2010). Figure 4.20 shows a computer estimation of what a picture of a face looks like to an infant at different ages from a distance of about 6 inches. Infants spend more time

FIGURE **4.20**

VISUAL ACUITY DURING THE FIRST MONTHS OF LIFE. The four photographs represent a computer estimation of what a picture of a face looks like to a 1-month-old, 2-month-old, 3-month-old, and 1-year-old (which approximates that of an adult).



looking at their mother's face than a stranger's face as early as 12 hours after being born (Bushnell, 2003). By 3 months of age, infants match voices to faces, distinguish between male and female faces, and discriminate between faces of their own ethnic group and those of other ethnic groups (Kelly & others, 2005, 2007; Pascalls & Kelly, 2008).

As infants develop, they change the way they gather information from the visual world, including human faces (Mareschal, Quinn, & Lea, 2010). A recent study recorded eye movements of 3-, 6-, and 9-month-old infants as they viewed clips from an animated film—*Charlie Brown's Christmas* (Frank, Vul, & Johnson, 2009). From 3 to 9 months of age, infants gradually began focusing their attention more on the faces in the animated film and less on salient background stimuli.

Also, as we discussed in the *Connecting Through Research* interlude, young infants can perceive certain patterns. With the help of his "looking chamber," Robert Fantz (1963) revealed that even 2- to 3-week-old infants prefer to look at patterned displays rather than nonpatterned displays. For example, they prefer to look at a normal human face rather than one with scrambled features, and prefer to look at a bull's-eye target or black-and-white stripes rather than a plain circle.

Color Vision The infant's color vision also improves (Kellman & Arterberry, 2006). By 8 weeks, and possibly by even 4 weeks, infants can discriminate some colors (Kelly, Borchert, & Teller, 1997). By 4 months of age, they have color preferences that mirror adults' in some cases, preferring saturated colors such as royal blue over pale blue, for example (Bornstein, 1975). In part, these changes in vision reflect maturation. Experience, however, is also necessary for vision to develop normally. For example, one study found that experience is necessary for normal color vision to develop (Sugita, 2004).

Perceptual Constancy Some perceptual accomplishments are especially intriguing because they indicate that the infant's perception goes beyond the information provided by the senses (Arterberry, 2008; Slater, Field, & Hernandez-Reif, 2007). This is the case in *perceptual constancy*, in which sensory stimulation is changing but perception of the physical world remains constant. If infants did not develop perceptual constancy, each time they saw an object at a different distance or in a different orientation, they would perceive it as a different object. Thus, the development of perceptual constancy allows infants to perceive their world as stable. Two types of perceptual constancy are size constancy and shape constancy.

Size constancy is the recognition that an object remains the same even though the retinal image of the object changes as you move toward or away from the object. The farther away from us an object is, the smaller its image is on our eyes. Thus, the size of an object on the retina is not sufficient to tell us its actual size. For example, you perceive a bicycle standing right in front of you as smaller than the car parked across the street, even though the bicycle casts a larger image on your eyes than the car does. When you move away from the bicycle, you do not perceive it to be shrinking even though its image on your retinas shrinks; you perceive its size as constant.

But what about babies? Do they have size constancy? Researchers have found that babies as young as 3 months of age show size constancy (Bower, 1966; Day & McKenzie, 1973). However, at 3 months of age, this ability is not full-blown. It continues to develop until 10 or 11 years of age (Kellman & Banks, 1998).

Shape constancy is the recognition that an object remains the same shape even though its orientation to us changes. Look around the room you are in right now. You likely see objects of varying shapes, such as tables and chairs. If you get up and walk around the room, you will see these objects from different sides and angles. Even though your retinal image of the objects changes as you walk and look, you will still perceive the objects as the same shape.

Do babies have shape constancy? As with size constancy, researchers have found that babies as young as 3 months of age have shape constancy (Bower,

size constancy The recognition that an object remains the same even though the retinal image of the object changes as you move toward or away from the object.

shape constancy The recognition that an object's shape remains the same even though its orientation to us changes.

1966; Day & McKenzie, 1973). Three-month-old infants, however, do not have shape constancy for irregularly shaped objects, such as tilted planes (Cook & Birch, 1984).

Perception of Occluded Objects Look around where you are now. You likely see that some objects are partly occluded by other objects that are in front of them—possibly a desk behind a chair, some books behind a computer, or a car parked behind a tree. Do infants perceive an object as complete when it is occluded by an object in front of it?

In the first two months of postnatal development, infants don't perceive occluded objects as complete, instead only perceiving what is visible (Johnson, 2009). Beginning at about 2 months of age, infants develop the ability to perceive that occluded objects are whole (Slater, Field, & Hernandez-Reif, 2007). How does perceptual completion develop? In Scott Johnson's research (2004, 2009, 2010a, b; Johnson & others, 2000), learning, experience, and self-directed exploration via eye movements play key roles in the development of perceptual completion in young infants.

Many of the objects in the world that are occluded appear and disappear behind closer objects, as when you are walking down the street and see cars appear and disappear behind buildings as they move or you move. Infants develop the ability to track briefly occluded moving objects at about 3 to 5 months of age (Bertenthal, 2008). A recent study explored the ability of 5- to 9-month-old infants to track moving objects that disappeared gradually behind an occluded partition, disappeared abruptly, or imploded (shrank quickly in size) (Bertenthal, Longo, & Kenny, 2007) (see Figure 4.21). In this study, the infants were more likely to accurately predict the moving object when it disappeared gradually rather than abruptly or imploding.

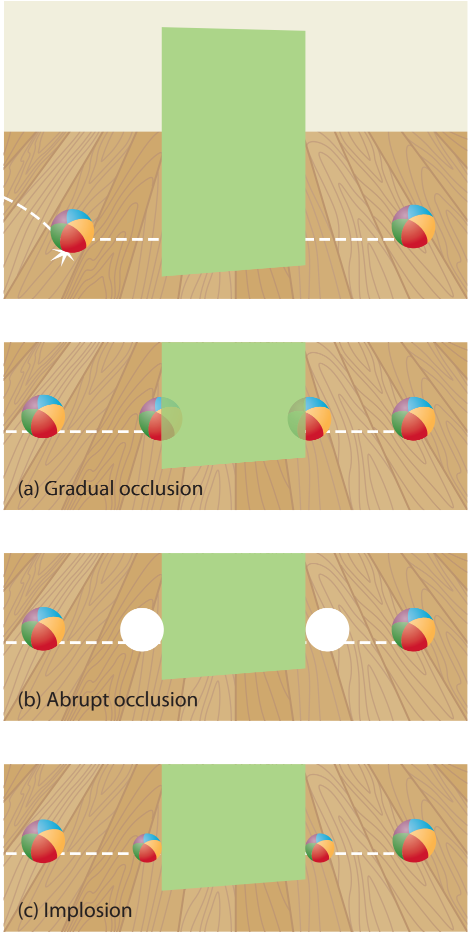


FIGURE **4.21**

INFANTS' PREDICTIVE TRACKING OF A BRIEFLY OCCLUDED MOVING BALL. The top photograph shows the visual scene that infants experienced. At the beginning of each event, a multicolored ball bounced up and down with an accompanying bouncing sound, and then rolled across the floor until it disappeared behind the partition. The bottom drawing shows the three stimulus events that the 5- to 9-month-old infants experienced: (*a*) *Gradual occlusion*—the ball gradually disappears behind the right side of the occluding partition located in the center of the display. (*b*) *Abrupt occlusion*—the ball abruptly disappears when it reaches the location of the white circle and then abruptly reappears 2 seconds later at the location of the second white circle on the other side of the occluding partition. (*c*) *Implosion*—the rolling ball quickly decreases in size as it approaches the occluding partition and rapidly increases in size as it reappears on the other side of the occluding partition.

Depth Perception Might infants even perceive depth? To investigate this question, Eleanor Gibson and Richard Walk (1960) constructed a miniature cliff with a dropoff covered by glass in their laboratory. They placed infants on the edge of this visual cliff and had their mothers coax them to crawl onto the glass (see Figure 4.22). Most infants would not crawl out on the glass, choosing instead to remain on the shallow side, an indication that they could perceive depth.

The 6- to 12-month-old infants in the visual cliff experiment had extensive visual experience. Do younger infants without this experience still perceive depth? Since younger infants do not crawl, this question is difficult to answer. Two- to 4-month-old infants show differences in heart rate when they are placed directly on the deep side of the visual cliff instead of on the shallow side (Campos, Langer, & Krowitz, 1970). However, these differences might mean that young infants respond to differences in some visual characteristics of the deep and shallow cliffs, with no actual knowledge of depth. Although researchers do not know exactly how early in life infants can perceive depth, we do know that infants develop the ability to use binocular cues to depth by about 3 to 4 months of age.

Researchers also are interested in fine-detail depth perception, which is called *stereoacuity*. A study using random-dot TV patterns showed that stereoacuity did not improve from 6 to 12 months of age but improved rapidly after 1 year of age (Takai & others, 2005).

OTHER SENSES

Other sensory systems besides vision also develop during infancy. We will explore development in hearing, touch and pain, smell, and taste.

Hearing During the last two months of pregnancy, as the fetus nestles in its mother's womb, it can hear sounds such as the mother's voice, music, and so on

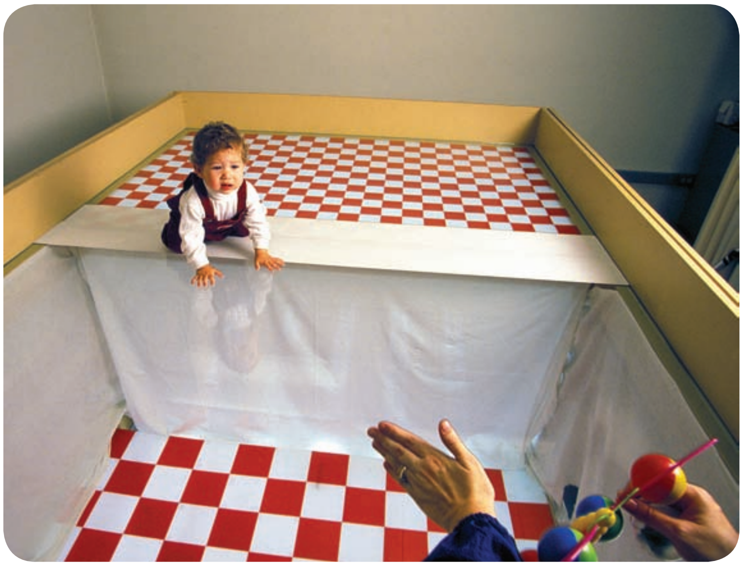


FIGURE **4.22**

EXAMINING INFANTS' DEPTH PERCEPTION ON THE VISUAL CLIFF. Eleanor Gibson and Richard Walk (1960) found that most infants would not crawl out on the glass, which, according to Gibson and Walk, indicated that they had depth perception. However, critics point out that the visual cliff is a better indication of the infant's social referencing and fear of heights than of the infant's perception of depth.

(Kisilevsky & others, 2009; Morokuma & others, 2008). Two psychologists wanted to find out if a fetus that heard Dr. Seuss' classic story *The Cat in the Hat* while still in the mother's womb would prefer hearing the story after birth (DeCasper & Spence, 1986). During the last months of pregnancy, 16 women read *The Cat in the Hat* to their fetuses. Then shortly after they were born, the mothers read either *The Cat in the Hat* or a story with a different rhyme and pace, *The King, the Mice and the Cheese* (which was not read to them during prenatal development). The infants sucked on a nipple in a different way when the mothers read the two stories, suggesting that the infants recognized the pattern and tone of *The Cat in the Hat* (see Figure 4.23). This study illustrates not only that a fetus can hear but also that it has a remarkable ability to learn even before birth.

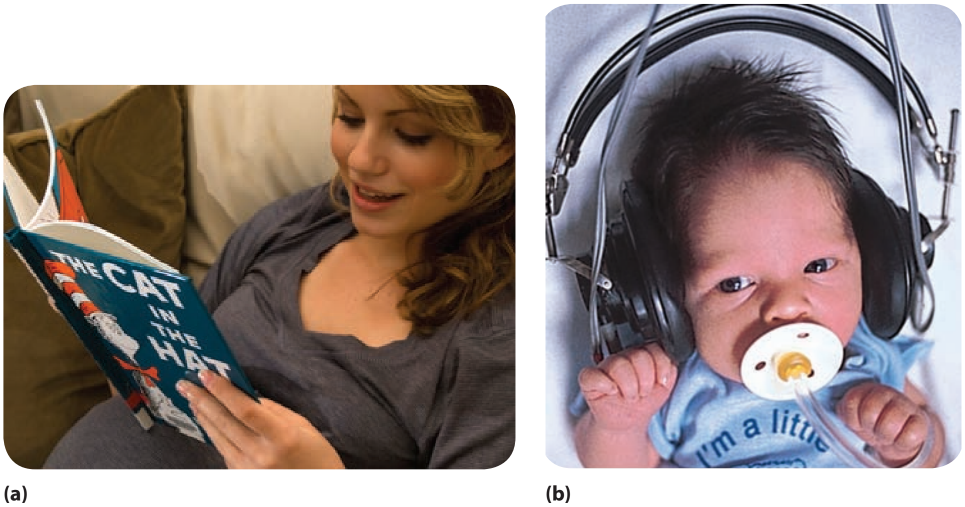
The fetus can also recognize the mother's voice, as one study demonstrated (Kisilevsky & others, 2003). Sixty term fetuses (mean gestational age, 38.4 weeks) were exposed to a tape recording either of their mother or of a female stranger reading a passage. The sounds of the tape were delivered through a loudspeaker held just above the mother's abdomen. Fetal heart rate increased in response to the mother's voice but decreased in response to the stranger's voice.

What kind of changes in hearing take place during infancy? They involve perception of a sound's loudness, pitch, and localization:

- *Loudness.* Immediately after birth, infants cannot hear soft sounds quite as well as adults can; a stimulus must be louder to be heard by a newborn than by an adult (Trehub & others, 1991). For example, an adult can hear a whisper from about 4 to 5 feet away, but a newborn requires that sounds be closer to a normal conversational level to be heard at that distance.
- *Pitch.* Infants are also less sensitive to the pitch of a sound than adults are. *Pitch* is the perception of the frequency of a sound. A soprano voice sounds high pitched, a bass voice low pitched. Infants are less sensitive to low-pitched sounds and are more likely to hear high-pitched sounds (Aslin, Jusczyk, & Pisoni, 1998). By 2 years of age, infants have considerably improved their ability to distinguish sounds with different pitches.

FIGURE **4.23**

HEARING IN THE WOMB. (*a*) Pregnant mothers read *The Cat in the Hat* to their fetuses during the last few months of pregnancy. (*b*) When they were born, the babies preferred listening to a recording of their mothers reading *The Cat in the Hat,* as evidenced by their sucking on a nipple that produced this recording, rather than another story, *The King, the Mice and the Cheese.*



(a) **(b)**

THE CAT IN THE HAT
I'm a little

- *Localization.* Even newborns can determine the general location from where a sound is coming, but by 6 months of age, they are more proficient at *localizing* sounds or detecting their origins. Their ability to localize sounds continues to improve in the second year (Saffran, Werker, & Werner, 2006).

Touch and Pain Do newborns respond to touch? Can they feel pain?

Newborns do respond to touch. A touch to the cheek produces a turning of the head; a touch to the lips produces sucking movements.

Newborns can also feel pain (Field & Hernandez-Reif, 2008; Gunnar & Quevado, 2007). If and when you have a son and consider whether he should be circumcised, the issue of an infant's pain perception probably will become important to you. Circumcision is usually performed on young boys about the third day after birth. Will your young son experience pain if he is circumcised when he is 3 days old? An investigation by Megan Gunnar and her colleagues (1987) found that newborn infant males cried intensely during circumcision. The circumcised infant also displays amazing resiliency. Within several minutes after the surgery, they can nurse and interact in a normal manner with their mothers. And, if allowed to, the newly circumcised newborn drifts into a deep sleep, which seems to serve as a coping mechanism.

For many years, doctors performed operations on newborns without anesthesia. This practice was accepted because of the dangers of anesthesia and because of the supposition that newborns do not feel pain. As researchers demonstrated that newborns can feel pain, the practice of operating on newborns without anesthesia is being challenged. Anesthesia now is used in some circumcisions (Taddio, 2008).

The important ability to connect information about vision with information about touch is evident during infancy. Coordination of vision and touch has been well documented in 6-month-olds (Rose, 1990) and in one study was demonstrated in 2- to 3-month-olds (Streri, 1987).

FIGURE **4.24**

NEWBORNS' PREFERENCE FOR THE SMELL OF THEIR MOTHER'S BREAST PAD. In the experiment by MacFarlane (1975), 6-day-old infants preferred to smell their mother's breast pad rather than a clean one that had never been used, but 2-day-old infants did not show the preference, indicating that this odor preference requires several days of experience to develop.

Smell Newborns can differentiate odors (Doty & Shah, 2008). The expressions on their faces seem to indicate that they like the way vanilla and strawberry smell but do not like the way rotten eggs and fish smell (Steiner, 1979). In one investigation, 6-day-old infants who were breast fed showed a clear preference for smelling their mother's breast pad rather than a clean breast pad (MacFarlane, 1975) (see Figure 4.24). However, when they were 2 days old, they did not show this preference, indicating that they require several days of experience to recognize this odor.

Taste Sensitivity to taste might be present even before birth (Doty & Shah, 2008). When saccharin was added to the amniotic fluid of a near-term fetus, swallowing increased (Windle, 1940). In one study, even at only two hours of age, babies made different facial expressions when they tasted sweet, sour, and bitter solutions (Rosenstein & Oster, 1988) (see Figure 4.25). At about 4 months of age, infants begin to prefer salty tastes, which as newborns they had found to be aversive (Harris, Thomas, & Booth, 1990).

INTERMODAL PERCEPTION

Imagine yourself playing basketball or tennis. You are experiencing many visual inputs: the ball coming and going, other players moving around, and so on. However, you are experiencing many auditory inputs as well: the sound of the ball bouncing or being hit, the grunts and groans, and so on. There is good correspondence between much of the visual and auditory information: When you see the ball bounce, you hear a bouncing sound; when a player stretches to hit a ball, you hear a groan. When you look at and listen to what is going on, you do not experience just the sounds or just the sights—you put all these things together. You experience a unitary episode. This is **intermodal perception**, which involves

intermodal perception The ability to relate and integrate information from two or more sensory modalities, such as vision and hearing.

integrating information from two or more sensory modalities, such as vision and hearing (Brenner & others, 2010; Walker & others, 2010.

Early, exploratory forms of intermodal perception exist even in newborns (Bahrick & Hollich, 2008). For example, newborns turn their eyes and their head toward the sound of a voice or rattle when the sound is maintained for several seconds (Clifton & others, 1981), but the newborn can localize a sound and look at an object only in a crude way (Bechtold, Bushnell, & Salapatek, 1979). These early forms of intermodal perception become sharpened with experience in the first year of life (Hollich, Newman, & Jusczyk, 2005). In one study, infants as young as 3 months old looked more at their mother when they also heard her voice and longer at their father when they also heard his voice (Spelke & Owsley, 1979). Thus even young infants can coordinate visual-auditory information involving people.

Can young infants put vision and sound together as precisely as adults do? In the first six months, infants have difficulty connecting sensory input from different modes, but in the second half of the first year they show an increased ability to make this connection mentally.

Thus, babies are born into the world with some innate abilities to perceive relations among sensory modalities, but their intermodal abilities improve considerably through experience (Banks, 2005). As with all aspects of development, in perceptual development, nature and nurture interact and cooperate (Banks, 2005).

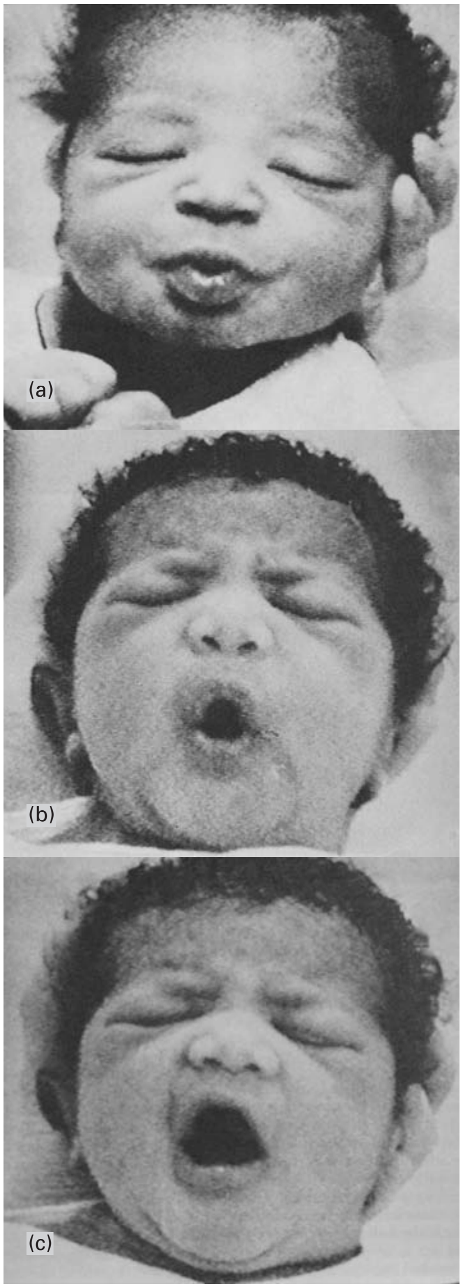


FIGURE **4.25**

NEWBORNS' FACIAL RESPONSES TO BASIC TASTES. Facial expressions elicited by (*a*) a sweet solution, (*b*) a sour solution, and (*c*) a bitter solution.

NATURE, NURTURE, AND PERCEPTUAL DEVELOPMENT

Now that we have discussed many aspects of perceptual development, let's explore one of developmental psychology's key issues as it relates to perceptual development: the nature-nurture issue. There has been a longstanding interest in how strongly infants' perception is influenced by nature or nurture (Aslin, 2009; Johnson, 2009, 2010a, b; Slater & others, 2010). In the field of perceptual development, nature proponents are referred to as *nativists* and those who emphasize learning and experience are called *empiricists.*

In the nativist view, the ability to perceive the world in a competent, organized way is inborn or innate. At the beginning of our discussion of perceptual development, we examined the ecological view of the Gibsons' because it has played such a pivotal role in guiding research in perceptual development. The Gibsons' ecological view leans toward a nativist explanation of perceptual development because it holds that perception is direct and evolved over time to allow the detection of size and shape constancy, a three-dimensional world, intermodal perception, and so on, early in infancy. However, the Gibsons' view is not entirely nativist because they emphasized that "perceptual development involves distinctive features that are detected at different ages" (Slater & others, 2010).

The Gibsons' ecological view is quite different from Piaget's constructivist view that reflects an empiricist approach to explaining perceptual development. According to Piaget, much of perceptual development in infancy must await the development of a sequence of cognitive stages for infants to construct more complex perceptual tasks. Thus, in Piaget's view the ability to perceive size and shape constancy, a three-dimensional world, intermodal perception, and so on, develops later in infancy than the Gibsons envision.

Today, it is clear that an extreme empiricist position on perceptual development is unwarranted. Much of early perception develops from innate (nature) foundations and the basic foundation of many perceptual abilities can be detected in newborns, whereas others unfold maturationally (Arterberry, 2008). However, as infants develop, environmental experiences (nurture) refine or calibrate many perceptual functions, and they may be the driving force behind some functions (Amso & Johnson, 2010). The accumulation of experience with and knowledge about their perceptual world contributes to infants' ability to perceive coherent perceptions of people and things (Slater & others, 2010). Thus, a full portrait of perceptual development includes the influence of nature, nurture, and a developing sensitivity to information (Arterberry, 2008).

PERCEPTUAL-MOTOR COUPLING

As we come to the end of this chapter, we return to the important theme of perceptual-motor coupling. The distinction between perceiving and doing has been a time-honored tradition in psychology. However, a number of experts on perceptual and motor development question whether this distinction makes sense (Soska, Adolph, & Johnson, 2010; Thelen & Smith, 2006). The main thrust of research in Esther Thelen's dynamic systems approach is to explore how people assemble motor behaviors for perceiving and acting. The main theme of the ecological approach of Eleanor and James J. Gibson is to discover how perception guides action. Action can guide perception, and perception can guide action. Only by moving one's eyes, head, hands, and arms and by moving from one location to another can an individual fully experience his or her environment and learn how to adapt to it. Perception and action are coupled (Corbetta & Snapp-Childs, 2009; Kim & Johnson, 2010).

Babies, for example, continually coordinate their movements with perceptual information to learn how to maintain balance, reach for objects in space, and move across various surfaces and terrains (Adolph & Joh, 2009; Thelen & Smith, 2006). They are motivated to move by what they perceive. Consider the sight of an attractive toy across the room. In this situation, infants must perceive the current state of their bodies and learn how to use their limbs to reach the toy. Although their movements at first are awkward and uncoordinated, babies soon learn to select patterns that are appropriate for reaching their goals.

Equally important is the other part of the perception-action coupling. That is, action educates perception (Soska, Adolf, & Johnson, 2010; Thelen & Smith, 2006). For example, watching an object while exploring it manually helps infants to discriminate its texture, size, and hardness. Locomoting in the environment teaches babies about how objects and people look from different perspectives, or whether surfaces will support their weight.

How do infants develop new perceptual-motor couplings? Recall from our discussion earlier in this chapter that in the traditional view of Gesell, infants' perceptual-motor development is prescribed by a genetic plan to follow a fixed and sequential progression of stages in development. The genetic determination view has been replaced by the dynamic systems view that infants learn new perceptual-motor couplings by assembling skills for perceiving and acting. New perceptual-motor coupling is not passively accomplished; rather, the infant actively develops a skill to achieve a goal within the constraints set by the infant's body and the environment.

Children perceive in order to move and move in order to perceive. Perceptual and motor development do not occur in isolation from each other but instead are coupled.

How are perception and action coupled in children's development?

> The infant is by no means as helpless as it looks and is quite capable of some very complex and important actions.
>
> —**Herb Pick**
>
> *Contemporary Developmental Psychologist, University of Minnesota*

Review *Connect* Reflect

LG3 Summarize the course of sensory and perceptual development in infancy.

Review

- What are sensation and perception?
- What is the ecological view of perception?
- How does visual perception develop in infancy?
- How do hearing, touch and pain, smell, and taste develop in infancy?
- What is intermodal perception?
- What roles do nature and nurture play in perceptual development?
- How is perceptual-motor development coupled?

Connect

- Perceptual-motor coupling was discussed in the previous section as well as in this section. Describe how this concept could be linked to the concept of nature vs. nurture (p. 140).

Reflect *Your Own Personal Journey of Life*

- How much sensory stimulation would you provide your own baby? A little? A lot? Could you overstimulate your baby? Explain.

topical connections

In the next chapter, you will read about the remarkable cognitive changes that characterize infant development and how early infants competently process information about their world. Advances in infants' cognitive development—together with the development of the brain and perceptual-motor advances discussed in this chapter—allow infants to adapt more effectively to their environment. In Chapter 7, we will further explore physical development when we examine how children progress through the early childhood years (ages 2 to 5). Young children's physical development continues to change and become more coordinated in early childhood, although gains in height and weight are not as dramatic in early childhood as in infancy.

looking forward

reach your **learning goals**

1 Physical Growth and Development in Infancy

LG1 Discuss physical growth and development in infancy.

Patterns of Growth	The cephalocaudal pattern is the sequence in which growth proceeds from top to bottom. The proximodistal pattern is the sequence in which growth starts at the center of the body and moves toward the extremities.
Height and Weight	The average North American newborn is 20 inches long and weighs 7 pounds. Infants grow about 1 inch per month in the first year and nearly triple their weight by their first birthday. The rate of growth slows in the second year.
The Brain	One of the most dramatic changes in the brain in the first two years of life is dendritic spreading, which increases the connections between neurons. Myelination, which speeds the conduction of nerve impulses, continues through infancy and even into adolescence. The cerebral cortex has two hemispheres (left and right). Lateralization refers to specialization of function in one hemisphere or the other. Early experiences play an important role in brain development. Neural connections are formed early in an infant's life. Before birth, genes mainly direct neurons to different locations. After birth, the inflowing stream of sights, sounds, smells, touches, language, and eye contact help shape the brain's neural connections, as does stimulation from caregivers and others.
Sleep	Newborns usually sleep about 18 hours a day. By 6 months of age, many American infants approach adult-like sleeping patterns. REM sleep—during which dreaming occurs—is present more in early infancy than in childhood and adulthood. Sleeping arrangements for infants vary across cultures. In America, infants are more likely to sleep alone than in many other cultures. Some experts believe shared sleeping can lead to sudden infant death syndrome (SIDS), a condition that occurs when a sleeping infant suddenly stops breathing and dies without an apparent cause.
Nutrition	Infants need to consume about 50 calories per day for each pound they weigh. The growing consensus is that in most instances breast feeding is superior to bottle feeding for both the infant and the mother, although the correlational nature of

studies must be considered. Severe infant malnutrition is still prevalent in many parts of the world. A special concern in impoverished countries is early weaning from breast milk and the misuse and hygiene problems associated with bottle feeding in these countries. The Women, Infants, and Children (WIC) program has shown positive benefits in low-income families.

2 Motor Development

LG2 Describe infants' motor development.

The Dynamic Systems View

- Thelen's dynamic systems theory seeks to explain how motor behaviors are assembled for perceiving and acting. Perception and action are coupled. According to this theory, motor skills are the result of many converging factors, such as the development of the nervous system, the body's physical properties and its movement possibilities, the goal the child is motivated to reach, and environmental support for the skill. In the dynamic systems view, motor development is far more complex than the result of a genetic blueprint.

Reflexes

- Reflexes—automatic movements—govern the newborn's behavior. They include the sucking, rooting, and Moro reflexes. The rooting and Moro reflexes disappear after three to four months. Permanent reflexes include coughing and blinking. For infants, sucking is an especially important reflex because it provides a means of obtaining nutrition.

Gross Motor Skills

- Gross motor skills involve large-muscle activities. Key skills developed during infancy include control of posture and walking. Although infants usually learn to walk by their first birthday, the neural pathways that allow walking begin to form earlier. The age at which infants reach milestones in the development of gross motor skills may vary by as much as two to four months, especially for milestones in late infancy.

Fine Motor Skills

- Fine motor skills involve finely tuned movements. The onset of reaching and grasping marks a significant accomplishment, and this becomes more refined during the first two years of life.

3 Sensory and Perceptual Development

LG3 Summarize the course of sensory and perceptual development in infancy.

What Are Sensation and Perception?

- Sensation occurs when information interacts with sensory receptors. Perception is the interpretation of sensation.

The Ecological View

- Created by the Gibsons, the ecological view states that we directly perceive information that exists in the world around us. Perception brings people in contact with the environment to interact with and adapt to it. Affordances provide opportunities for interaction offered by objects that fit within our capabilities to perform activities.

Visual Perception

- Researchers have developed a number of methods to assess the infant's perception, including the visual preference method (which Fantz used to determine young infants' interest in looking at patterned over nonpatterned displays), habituation and dishabituation, and tracking. The infant's visual acuity increases dramatically in the first year of life. Infants' color vision improves as they develop. Young infants systematically scan human faces. As early as 3 months of age, infants show size and shape constancy. At approximately 2 months of age, infants develop the ability to perceive that occluded objects are complete. In Gibson and Walk's classic study, infants as young as 6 months of age indicated they could perceive depth.

Other Senses

- The fetus can hear during the last two months of pregnancy. Immediately after birth, newborns can hear, but their sensory threshold is higher than that of adults. Developmental changes in the perception of loudness, pitch, and localization of sound occur during infancy. Newborns can respond to touch and feel pain. Newborns can differentiate odors, and sensitivity to taste may be present before birth.

Intermodal Perception

- Early, exploratory forms of intermodal perception—the ability to relate and integrate information from two or more sensory modalities—are present in newborns and become sharpened over the first year of life.

Nature, Nurture, and Perceptual Development

- In perception, nature advocates are referred to as nativists and nurture proponents are called empiricists. The Gibsons' ecological view that has guided much of perceptual development research leans toward a nativist approach but still allows for developmental changes in distinctive features. Piaget's constructivist view leans toward an empiricist approach emphasizing that many perceptual accomplishments must await the development of cognitive stages in infancy. A strong empiricist approach is unwarranted. A full account of perceptual development includes the roles of nature, nurture, and the developing sensitivity to information.

Perceptual-Motor Coupling

- Perception and action are often not isolated but rather are coupled. Individuals perceive in order to move and move in order to perceive.

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chapter 5

COGNITIVE DEVELOPMENT IN INFANCY

chapter **outline**

1 Piaget's Theory of Infant Development

Learning Goal 1 Summarize and evaluate Piaget's theory of infant development.

Cognitive Processes
The Sensorimotor Stage
Evaluating Piaget's Sensorimotor Stage

2 Learning, Remembering, and Conceptualizing

Learning Goal 2 Describe how infants learn, remember, and conceptualize.

Conditioning
Attention
Memory
Imitation
Concept Formation and Categorization

3 Individual Differences and Assessment

Learning Goal 3 Discuss infant assessment measures and the prediction of intelligence.

Measures of Infant Development
Predicting Intelligence

4 Language Development

Learning Goal 4 Describe the nature of language and how it develops in infancy.

Defining Language
Language's Rule Systems
How Language Develops
Biological and Environmental Influences
An Interactionist View

Jean Piaget, the famous Swiss psychologist, was a meticulous observer of his three children—Laurent, Lucienne, and Jacqueline. His books on cognitive development are filled with these observations. Here are a few of Piaget's observations of his children in infancy (Piaget, 1952):

- At 21 days of age, "Laurent found his thumb after three attempts: prolonged sucking begins each time. But, once he has been placed on his back, he does not know how to coordinate the movement of the arms with that of the mouth and his hands draw back even when his lips are seeking them" (p. 27).
- "During the third month, thumb sucking becomes less important to Laurent because of new visual and auditory interests. But, when he cries, his thumb goes to the rescue."
- Toward the end of Lucienne's fourth month, while she is lying in her crib, Piaget hangs a doll above her feet. Lucienne thrusts her feet at the doll and makes it move. "Afterward, she looks at her motionless foot for a second, then recommences. There is no visual control of her foot, for the movements are the same when Lucienne only looks at the doll or when I place the doll over her head. On the other hand, the tactile control of the foot is apparent: after the first shakes, Lucienne makes slow foot movements as though to grasp and explore" (p. 159).
- At 11 months, "Jacqueline is seated and shakes a little bell. She then pauses abruptly in order to delicately place the bell in front of her right foot; then she kicks hard. Unable to recapture it, she grasps a ball which she then places at the same spot in order to give it another kick" (p. 225).
- At 1 year, 2 months, "Jacqueline holds in her hands an object which is new to her: a round, flat box which she turns all over, shakes, [and] rubs against the bassinet. . . . She lets it go and tries to pick it up. But she only succeeds in touching it with her index finger, without grasping it. She nevertheless makes

topical **connections**

In Chapter 4, we learned that impressive advances occur in the development of the brain during infancy. Engaging in various physical, cognitive, and socioemotional activities strengthens the baby's neural connections. Motor and perceptual development also are key aspects of the infant's development. An important part of this development is the coupling of perceptions and actions. The nature-nurture issue continues to be debated with regard to the infant's perceptual development. In this chapter, we build on our understanding of the infant's brain, motor, and perceptual development by further examining how infants develop their competencies, focusing on how advances in their cognitive development help them adapt to their world, and how the nature-nurture issue is an important aspect of the infant's cognitive and language development.

looking ***back***

an attempt and presses on the edge. The box then tilts up and falls again" (p. 273). Jacqueline shows an interest in this result and studies the fallen box.

- At 1 year, 8 months, "Jacqueline arrives at a closed door with a blade of grass in each hand. She stretches out her right hand toward the [door] knob but sees that she cannot turn it without letting go of the grass. She puts the grass on the floor, opens the door, picks up the grass again, and enters. But when she wants to leave the room, things become complicated. She puts the grass on the floor and grasps the doorknob. But then she perceives that in pulling the door toward her she will simultaneously chase away the grass which she placed between the door and the threshold. She therefore picks it up in order to put it outside the door's zone of movement" (p. 339).

For Piaget, these observations reflect important changes in the infant's cognitive development. Piaget maintained that infants go through six substages as they progress in less than two short years from Laurent's thumb sucking to Jacqueline's problem solving.

preview

Piaget's descriptions of infants are just the starting point for our exploration of cognitive development. Excitement and enthusiasm about the study of infant cognition have been fueled by an interest in what newborns and infants know, by continued fascination about innate and learned factors in the infant's cognitive development, and by controversies about whether infants construct their knowledge (Piaget's view) or know their world more directly. In this chapter, we will study not only Piaget's theory of infant development but also learning, remembering, and conceptualizing by infants; individual differences; and language development.

1 Piaget's Theory of Infant Development

LG1 Summarize and evaluate Piaget's theory of infant development.

- Cognitive Processes
- The Sensorimotor Stage
- Evaluating Piaget's Sensorimotor Stage

Poet Nora Perry asks, "Who knows the thoughts of a child?" As much as anyone, Piaget knew. Through careful observations of his own three children—Laurent, Lucienne, and Jacqueline—and observations of and interviews with other children, Piaget changed perceptions of the way children think about the world.

Piaget's theory is a general, unifying story of how biology and experience sculpt cognitive development. Piaget thought that, just as our physical bodies have structures that enable us to adapt to the world, we build mental structures that help us to adapt to the world. *Adaptation* involves adjusting to new environmental demands. Piaget stressed that children actively construct their own cognitive worlds; information is not just poured into their minds from the environment. He sought to discover how children at different points in their development think about the world and how systematic changes in their thinking occur.

COGNITIVE PROCESSES

What processes do children use as they construct their knowledge of the world? Piaget developed several concepts to answer this question; especially important are schemes, assimilation, accommodation, organization, equilibrium, and equilibration.

In Piaget's view, what is a scheme? What schemes might this young infant be displaying?

Schemes As the infant or child seeks to construct an understanding of the world, said Piaget (1954), the developing brain creates **schemes.** These are actions or mental representations that organize knowledge. In Piaget's theory, behavioral schemes (physical activities) characterize infancy, and mental schemes (cognitive activities) develop in childhood (Lamb, Bornstein, & Teti, 2002). A baby's schemes are structured by simple actions that can be performed on objects such as sucking, looking, and grasping. Older children have schemes that include strategies and plans for solving problems. For example, in the descriptions at the opening of this chapter, Laurent displayed a scheme for sucking; Jacqueline displayed a problem-solving scheme when she was able to open the door without losing her blades of grass. By the time we have reached adulthood, we have constructed an enormous number of diverse schemes, ranging from driving a car to balancing a budget to understanding the concept of fairness.

Assimilation and Accommodation To explain how children use and adapt their schemes, Piaget offered two concepts: assimilation and accommodation. **Assimilation** occurs when children use their existing schemes to deal with new information or experiences. **Accommodation** occurs when children adjust their schemes to take new information and experiences into account.

Think about a toddler who has learned the word *car* to identify the family's car. The toddler might call all moving vehicles on roads "cars," including motorcycles and trucks; the child has assimilated these objects to his or her existing scheme. But the child soon learns that motorcycles and trucks are not cars and fine-tunes the category to exclude motorcycles and trucks, accommodating the scheme.

We are born capable of learning.

—JEAN-JACQUES ROUSSEAU

Swiss-Born French Philosopher, 18th Century

Assimilation and accommodation operate even in very young infants. Newborns reflexively suck everything that touches their lips; they assimilate all sorts of objects into their sucking scheme. By sucking different objects, they learn about their taste, texture, shape, and so on. After several months of experience, though, they construct their understanding of the world differently. Some objects, such as fingers and the mother's breast, can be sucked, and others, such as fuzzy blankets, should not be sucked. In other words, they accommodate their sucking scheme.

How might assimilation and accomodation be involved in infants' sucking?

Organization To make sense out of their world, said Piaget, children cognitively organize their experiences. **Organization** in Piaget's theory is the grouping of isolated behaviors and thoughts into a higher-order system. Continual refinement of this organization is an inherent part of development. A boy who has only a vague idea about how to use a hammer may also have a vague idea about how to use other tools. After learning how to use each one, he relates these uses, organizing his knowledge.

Equilibration and Stages of Development Assimilation and accommodation always take the child to a higher ground, according to Piaget. In trying to understand the world, the child inevitably experiences cognitive conflict, or *disequilibrium.* That is, the child is constantly faced with counterexamples to his or her existing schemes and with inconsistencies. For example, if a child believes that pouring water from a short and wide container into a tall and narrow container changes the amount of water, then the child might be puzzled by where the "extra" water came from and whether there is actually more water to drink. The puzzle creates disequilibrium; for Piaget, an internal search for equilibrium creates motivation for change. The child assimilates and accommodates, adjusting old schemes, developing new schemes, and organizing and reorganizing the old and new schemes. Eventually, the organization is fundamentally different from the old organization; it is a new way of thinking.

schemes In Piaget's theory, actions or mental representations that organize knowledge.

assimilation Piagetian concept of using existing schemes to deal with new information or experiences.

accommodation Piagetian concept of adjusting schemes to fit new information and experiences.

organization Piaget's concept of grouping isolated behaviors and thoughts into a higher-order, more smoothly functioning cognitive system.

Substage	Age	Description	Example
1 Simple reflexes	Birth to 1 month	Coordination of sensation and action through reflexive behaviors.	Rooting, sucking, and grasping reflexes; newborns suck reflexively when their lips are touched.
2 First habits and primary circular reactions	1 to 4 months	Coordination of sensation and two types of schemes: habits (reflex) and primary circular reactions (reproduction of an event that initially occurred by chance). Main focus is still on the infant's body.	Repeating a body sensation first experienced by chance (sucking thumb, for example); then infants might accommodate actions by sucking their thumb differently from how they suck on a nipple.
3 Secondary circular reactions	4 to 8 months	Infants become more object-oriented, moving beyond self-preoccupation; repeat actions that bring interesting or pleasurable results.	An infant coos to make a person stay near; as the person starts to leave, the infant coos again.
4 Coordination of secondary circular reactions	8 to 12 months	Coordination of vision and touch—hand-eye coordination; coordination of schemes and intentionality.	Infant manipulates a stick in order to bring an attractive toy within reach.
5 Tertiary circular reactions, novelty, and curiosity	12 to 18 months	Infants become intrigued by the many properties of objects and by the many things they can make happen to objects; they experiment with new behavior.	A block can be made to fall, spin, hit another object, and slide across the ground.
6 Internalization of schemes	18 to 24 months	Infants develop the ability to use primitive symbols and form enduring mental representations.	An infant who has never thrown a temper tantrum before sees a playmate throw a tantrum; the infant retains a memory of the event, then throws one himself the next day.

FIGURE **5.1**

PIAGET'S SIX SUBSTAGES OF SENSORIMOTOR DEVELOPMENT

In short, according to Piaget, children constantly assimilate and accommodate as they seek equilibrium. There is considerable movement between states of cognitive equilibrium and disequilibrium as assimilation and accommodation work in concert to produce cognitive change. **Equilibration** is the name Piaget gave to this mechanism by which children shift from one stage of thought to the next.

The result of these processes, according to Piaget, is that individuals go through four stages of development. A different way of understanding the world makes one stage more advanced than another. Cognition is *qualitatively* different in one stage compared with another. In other words, the way children reason at one stage is different from the way they reason at another stage. Here our focus is on Piaget's stage of infant cognitive development. In later chapters, when we study cognitive development in early childhood, middle and late childhood, and adolescence (Chapters 7, 9, and 11) we will explore the last three Piagetian stages.

THE SENSORIMOTOR STAGE

The **sensorimotor stage** lasts from birth to about 2 years of age. In this stage, infants construct an understanding of the world by coordinating sensory experiences (such as seeing and hearing) with physical, motoric actions—hence the term "sensorimotor." At the beginning of this stage, newborns have little more than reflexes with which to work. At the end of the sensorimotor stage, 2-year-olds can produce complex sensorimotor patterns and use primitive symbols. We first will summarize Piaget's descriptions of how infants develop. Later we will consider criticisms of his view.

Substages

Piaget divided the sensorimotor stage into six substages: (1) simple reflexes; (2) first habits and primary circular reactions; (3) secondary circular reactions; (4) coordination of secondary circular reactions; (5) tertiary circular reactions, novelty, and curiosity; and (6) internalization of schemes (see Figure 5.1).

Simple reflexes, the first sensorimotor substage, corresponds to the first month after birth. In this substage, sensation and action are coordinated primarily through reflexive behaviors, such as rooting and sucking. Soon the infant produces behaviors that resemble reflexes in the absence of the usual stimulus for the reflex. For example, a newborn will suck a nipple or bottle only when it is placed directly in the baby's mouth or touched to the lips. But soon the infant might suck when a bottle

developmental **connection**

Cognitive Theory. Recall the main characteristics of Piaget's four stages of cognitive development. Chapter 1, p. 24

equilibration A mechanism that Piaget proposed to explain how children shift from one stage of thought to the next.

sensorimotor stage The first of Piaget's stages, which lasts from birth to about 2 years of age; infants construct an understanding of the world by coordinating sensory experiences with motoric actions.

simple reflexes Piaget's first sensorimotor substage, which corresponds to the first month after birth. In this substage, sensation and action are coordinated primarily through reflexive behaviors.

or nipple is only nearby. Even in the first month of life, the infant is initiating action and actively structuring experiences.

First habits and primary circular reactions is the second sensorimotor substage, which develops between 1 and 4 months of age. In this substage, the infant coordinates sensation and two types of schemes: habits and primary circular reactions. A *habit* is a scheme based on a reflex that has become completely separated from its eliciting stimulus. For example, infants in substage 1 suck when bottles are put to their lips or when they see a bottle. Infants in substage 2 might suck even when no bottle is present. A *circular reaction* is a repetitive action.

A **primary circular reaction** is a scheme based on the attempt to reproduce an event that initially occurred by chance. For example, suppose an infant accidentally sucks his fingers when they are placed near his mouth. Later, he searches for his fingers to suck them again, but the fingers do not cooperate because the infant cannot coordinate visual and manual actions.

Habits and circular reactions are stereotyped—that is, the infant repeats them the same way each time. During this substage, the infant's own body remains the infant's center of attention. There is no outward pull by environmental events.

Secondary circular reactions is the third sensorimotor substage, which develops between 4 and 8 months of age. In this substage, the infant becomes more object-oriented, moving beyond preoccupation with the self. The infant's schemes are not intentional or goal-directed, but they are repeated because of their consequences. By chance, an infant might shake a rattle. The infant repeats this action for the sake of its fascination. This is a *secondary circular reaction:* an action repeated because of its consequences. The infant also imitates some simple actions, such as the baby talk or burbling of adults, and some physical gestures. However, the baby imitates only actions that he or she is already able to produce.

Coordination of secondary circular reactions is Piaget's fourth sensorimotor substage, which develops between 8 and 12 months of age. To progress into this substage the infant must coordinate vision and touch, hand and eye. Actions become more outwardly directed. Significant changes during this substage involve the coordination of schemes and intentionality. Infants readily combine and recombine previously learned schemes in a coordinated way. They might look at an object and grasp it simultaneously, or they might visually inspect a toy, such as a rattle, and finger it simultaneously, exploring it tactilely. Actions are even more outwardly directed than before. Related to this coordination is the second achievement—the presence of intentionality. For example, infants might manipulate a stick in order to bring a desired toy within reach or they might knock over one block to reach and play with another one. Similarly, when 11-month-old Jacqueline, as described in the chapter opening, placed the ball in front of her and kicked it, she was demonstrating intentionality.

Tertiary circular reactions, novelty, and curiosity is Piaget's fifth sensorimotor substage, which develops between 12 and 18 months of age. In this substage, infants become intrigued by the many properties of objects and by the many things that they can make happen to objects. A block can be made to fall, spin, hit another object, and slide across the ground. *Tertiary circular reactions* are schemes in which the infant purposely explores new possibilities with objects, continually doing new things to them and exploring the results. Piaget says that this stage marks the starting point for human curiosity and interest in novelty.

Internalization of schemes is Piaget's sixth and final sensorimotor substage, which develops between 18 and 24 months of age. In this substage, the infant develops the ability to use primitive symbols. For Piaget, a *symbol* is an internalized sensory image or word that represents an event. Primitive symbols permit the infant to think about concrete events without directly acting them out or perceiving them. Moreover, symbols allow the infant to manipulate and transform the represented events in simple ways. In a favorite Piagetian example, Piaget's young daughter saw a matchbox being opened and closed. Later, she mimicked the event by opening and closing her mouth. This was an obvious expression of her image of the event.

This 17-month-old is in Piaget's stage of tertiary circular reactions. *What might the infant do to suggest that she is in this stage?*

developmental **connection**

Cognitive Theory. What are some changes in symbolic thought in young children? Chapter 7, p. 217

first habits and primary circular reactions Piaget's second sensorimotor substage, which develops between 1 and 4 months of age. In this substage, the infant coordinates sensation and two types of schemes: habits and primary circular reactions.

primary circular reaction A scheme based on the attempt to reproduce an event that initially occurred by chance.

secondary circular reactions Piaget's third sensorimotor substage, which develops between 4 and 8 months of age. In this substage, the infant becomes more object-oriented, moving beyond preoccupation with the self.

coordination of secondary circular reactions Piaget's fourth sensorimotor substage, which develops between 8 and 12 months of age. Actions become more outwardly directed, and infants coordinate schemes and act with intentionality.

tertiary circular reactions, novelty, and curiosity Piaget's fifth sensorimotor substage, which develops between 12 and 18 months of age. In this substage, infants become intrigued by the many properties of objects and by the many things that they can make happen to objects.

Object Permanence Imagine how chaotic and unpredictable your life would be if you could not distinguish between yourself and your world. This is what the life of a newborn must be like, according to Piaget. There is no differentiation between the self and world; objects have no separate, permanent existence.

By the end of the sensorimotor period, objects are both separate from the self and permanent. **Object permanence** is the understanding that objects continue to exist even when they cannot be seen, heard, or touched. Acquiring the sense of object permanence is one of the infant's most important accomplishments, according to Piaget.

How could anyone know whether an infant had a sense of object permanence or not? The principal way that object permanence is studied is by watching an infant's reaction when an interesting object disappears (see Figure 5.2). If infants search for the object, it is assumed that they believe it continues to exist.

Object permanence is just one of the basic concepts about the physical world developed by babies. To Piaget, children, even infants, are much like little scientists, examining the world to see how it works. But how can adult scientists determine what these "baby scientists" are finding out about the world and at what age they're finding it out? Read *Connecting Through Research* to find out.

EVALUATING PIAGET'S SENSORIMOTOR STAGE

Piaget opened up a new way of looking at infants with his view that their main task is to coordinate their sensory impressions with their motor activity. However, the infant's cognitive world is not as neatly packaged as Piaget portrayed it, and some of Piaget's explanations for the cause of change are debated. In the past several decades, sophisticated experimental techniques have been devised to study infants, and there have been a large number of research studies on infant development. Much of the new research suggests that Piaget's view of sensorimotor development needs to be modified (Aslin, 2010; Johnson, 2010a, b; Oakes & others, 2010; Spelke & Kinzler, 2009).

The A-not-B Error One modification concerns Piaget's claim that certain processes are crucial in transitions from one stage to the next. The data do not always support his explanations. For example, in Piaget's theory, an important feature in the progression into substage 4, *coordination of secondary circular reactions,* is an infant's inclination to search for a hidden object in a familiar location rather than to look for the object in a new location. If a toy is hidden twice, initially at location A and subsequently at location B, 8- to 12-month-old infants search correctly at location A initially. But when the toy is subsequently hidden at location B, they make the mistake of continuing to search for it at location A. **A-not-B error** (also called AB error) is the term used to describe this common mistake. Older infants are less likely to make the A-not-B error because their concept of object permanence is more complete.

Researchers have found, however, that the A-not-B error does not show up consistently (Sophian, 1985). The evidence indicates that A-not-B errors are sensitive to the delay between hiding the object at B and the infant's attempt to find it (Diamond, 1985). Thus, the A-not-B error might be due to a failure in memory. Another explanation is that infants tend to repeat a previous motor behavior (Clearfield & others, 2006).

Perceptual Development and Expectations A number of theorists, such as Eleanor Gibson (2001) and Elizabeth Spelke (1991; Spelke & Kinzler, 2009), argue that infants' perceptual abilities are highly developed very early in development. Spelke concludes that young infants interpret the world as having predictable occurrences. For example, in Chapter 4 we discussed research that demonstrated the presence of intermodal perception—the ability to coordinate information from two more sensory modalities, such as vision and hearing—by 3½ months of age, much earlier than Piaget would have predicted (Spelke & Owsley, 1979).

Research also suggests that infants develop the ability to understand how the world works at a very early age (Aslin, 2010; Baillargeon & others, 2009a, b; Johnson, 2010a, b). For example, by the time they are 3 months of age, infants develop

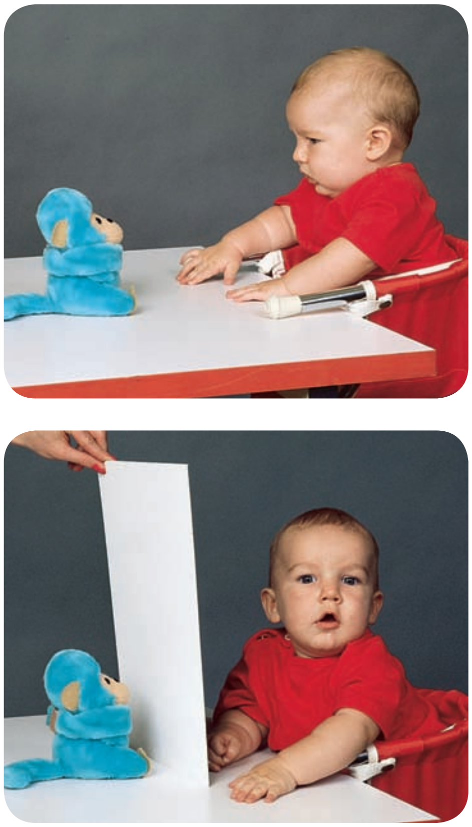


FIGURE **5.2**

OBJECT PERMANENCE. Piaget argued that object permanence is one of infancy's landmark cognitive accomplishments. For this 5-month-old boy, "out-of-sight" is literally out of mind. The infant looks at the toy monkey (*top*), but, when his view of the toy is blocked (*bottom*), he does not search for it. Several months later, he will search for the hidden toy monkey, an action reflecting the presence of object permanence.

developmental **connection**

Biological Processes. Eleanor Gibson was a pioneer in crafting the ecological perception view of development. Chapter 4, p. 132

internalization of schemes Piaget's sixth and final sensorimotor substage, which develops between 18 and 24 months of age. In this substage, the infant develops the ability to use primitive symbols.

object permanence The Piagetian term for understanding that objects and events continue to exist, even when they cannot directly be seen, heard, or touched.

A-not-B error Error that occurs when infants make the mistake of selecting the familiar hiding place (A) rather than the new hiding place (B) as they progress into substage 4 in Piaget's sensorimotor stage; also called AB error.

connecting through research

How Do Researchers Study Infants' Understanding of Object Permanence and Causality?

Two accomplishments of infants that Piaget examined were the development of object permanence and the child's understanding of causality. Let's examine two research studies that address these topics.

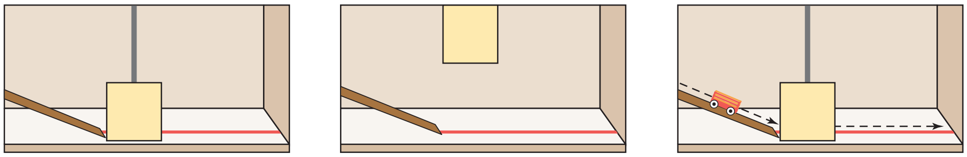
In both studies, Renée Baillargeon and her colleagues used a research method that involves *violation of expectations*. In this method, infants see an event happen as it normally would. Then, the event is changed, often in a way that creates a physically impossible event. That an infant looks longer at the changed event indicates he or she is surprised by it. In other words, the reaction is interpreted to indicate that the infant had certain expectations about the world that were violated.

In one study focused on object permanence, researchers showed infants a toy car that moved down an inclined track, disappeared behind a screen, and then reemerged at the other end, still on the track (Baillargeon & DeVos, 1991) (see Figure 5.3) (*a*). After this sequence was repeated several times, something different occurred: A toy mouse was placed *behind* the tracks but was hidden by the screen while the car rolled by (*b*). This was the "possible" event. Then, the researchers created an "impossible event": The toy mouse was placed *on* the tracks but was secretly removed after the screen was lowered so that the car seemed to go through the mouse (*c*). In this study, infants as young as 3 months of age took a longer look at the impossible event than at the possible event, indicating that they were surprised by it. Their surprise suggested that they remembered not only that the toy mouse still existed (object permanence) but its location.

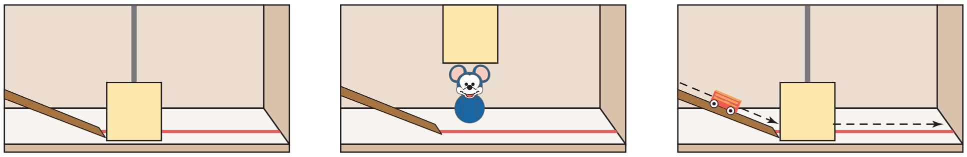
Another study focused on the infant's understanding of causality (Kotovsky & Baillargeon, 1994). In this research, a cylinder rolls down a ramp and hits a toy bug at the bottom of the ramp. By 5 and 6 months of age, after infants have seen how far the bug will be pushed by a medium-sized cylinder, their reactions indicate that they understand that the bug will roll farther if it is hit by a large cylinder than if it is hit by a small cylinder. Thus, by the middle of the first year of life these infants understood that the size of a moving object determines how far it will move a stationary object that it collides with.

In Baillargeon's (2008; Baillargeon & others, 2009a, b) view, infants have a pre-adapted, innate bias called the *principle of persistence* that explains their assumption that objects don't change their properties—including how solid they are, their location, their color, and their form—unless some external factor (a person moves the object, for example) obviously intervenes. Shortly, we will revisit the extent to which nature and nurture are at work in the changes that take place in the infant's cognitive development.

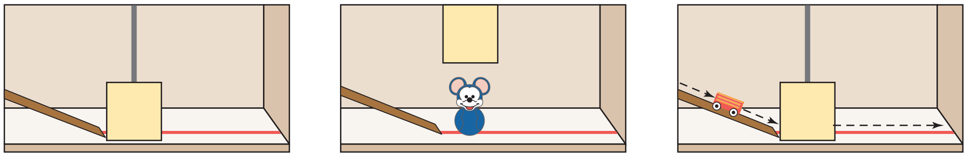
The research findings discussed in this interlude and other research indicate that infants develop object permanence and causal reasoning much earlier than Piaget proposed (Baillargeon & others, 2009a, b; Luo, Kaufman, & Baillargeon, 2009). Indeed, as you will see in the next section, a major theme of infant cognitive development today is that infants are more cognitively competent than Piaget envisioned.



(a) Practice (No toy mouse)



(b) Possible event (Toy mouse behind the track)



(c) Impossible event (Toy mouse on the track)

FIGURE **5.3**

USING THE VIOLATION OF EXPECTATIONS METHOD TO STUDY OBJECT PERMANENCE IN INFANTS. If infants looked longer at (*c*) than at (*b*), researchers reasoned that the impossible event in (*c*) violated the infants' expectations and that they remembered that the toy mouse existed.

expectations about future events. Marshall Haith and his colleagues (Canfield & Haith, 1991; Haith, Hazen, & Goodman, 1988) presented pictures to infants in either a regular alternating sequence (such as left, right, left, right) or an unpredictable sequence (such as right, right, left, right). When the sequence was predictable, the 3-month-old infants began to anticipate the location of the picture, looking at the side on which it was expected to appear. However, younger infants did not develop expectations about where a picture would be presented.

What kinds of expectations do infants form? Experiments by Spelke (1991, 2000; Spelke & Hespos, 2001) have addressed these questions. She placed babies before a puppet stage and showed them a series of actions that are unexpected if you know how the physical world works—for example, one ball seemed to roll through a solid barrier, another seemed to leap between two platforms, and a third appeared to hang in midair (Spelke, 1979). Spelke measured and compared the babies' looking times for unexpected and expected actions. She concluded that by 4 months of age, even though infants do not yet have the ability to talk about objects, move around objects, manipulate objects, or even see objects with high resolution, they expect objects to be solid and continuous. However, at 4 months of age, infants do not expect an object to obey gravitational constraints (Spelke, Breinlinger, & Macomber, 1992). Similarly, research by Renée Baillargeon and her colleagues (1995, 2004) documents that infants as young as 3 to 4 months expect objects to be *substantial* (in the sense that other objects cannot move through them) and *permanent* (in the sense that objects continue to exist when they are hidden).

In sum, researchers conclude that infants see objects as bounded, unitary, solid, and separate from their background, possibly at birth or shortly thereafter, but definitely by 3 to 4 months of age, much earlier than Piaget envisioned. Young infants still have much to learn about objects, but the world appears both stable and orderly to them.

However, some critics, such as Andrew Meltzoff (2008; Meltzoff & Moore, 1998), argue that Spelke's and Baillargeon's research relies on how long infants look at unexpected events and thus assess infants' *perceptual expectations* about where and when objects will reappear rather than tapping their *knowledge* about where the objects are when they are out of sight. Meltzoff points out that whether infants act on their perception is an important aspect of assessing object permanence; he states that it does not appear that young infants can act on the information. Thus, Meltzoff (2008) concludes that whether longer looking time is a valid measure of object permanence and how early infants develop object permanence remains controversial.

By 6 to 8 months, infants have learned to perceive gravity and support—that an object hanging on the end of a table should fall, that ball-bearings will travel farther when rolled down a longer rather than a shorter ramp, and that cup handles will not fall when attached to a cup (Slater, Field, & Hernandez-Reif, 2007). As infants develop, their experiences and actions on objects help them to understand physical laws (Bremner, 2007; Johnson, 2010a, b).

A 4-month-old in Elizabeth Spelke's infant perception laboratory is tested to determine if she knows that an object in motion will not stop in midair. Spelke concluded that at 4 months babies don't expect objects like these balls to obey gravitational constraints, but that they do expect objects to be solid and continuous. Research by Spelke, Renée Baillargeon, and others suggest that infants develop an ability to understand how the world works earlier than Piaget envisioned. However, critics such as Andrew Meltzoff fault their research and conclude there is still controversy about how early some infant cognitive accomplishments occur.

The Nature-Nurture Issue In considering the big issue of whether nature or nurture plays the more important role in infant development, Elizabeth Spelke (Spelke, 2000; 2003; Spelke & Kinzler, 2007, 2009) comes down clearly on the side of nature. Spelke endorses a **core knowledge approach,** which states that infants are born with domain-specific innate knowledge systems. Among these domain-specific knowledge systems are those involving space, number sense, object permanence, and language (which we will discuss later in this chapter). Strongly influenced by evolution, the core knowledge domains are theorized to be prewired to allow infants to make sense of their world. After all, Spelke concludes, how could infants possibly grasp the complex world in which they live if they didn't come into the world equipped with core sets of knowledge. In this approach, the innate core knowledge domains form a foundation around which more mature cognitive

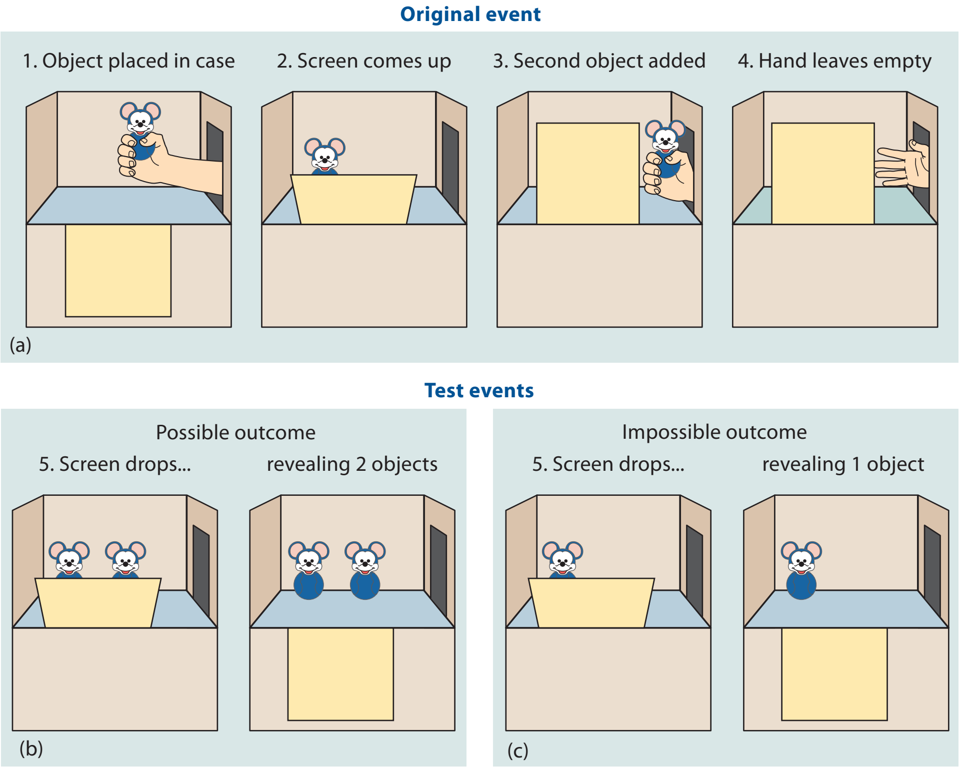
developmental **connection**

Nature vs. Nurture. The nature-nurture debate is one of developmental psychology's main issues. Chapter 1, p. 20

core knowledge approach States that infants are born with domain-specific innate knowledge systems.

FIGURE **5.4**

INFANTS' NUMBER SENSE. Shown here is one of the sequences in Karen Wynn's (1992) study of 5-month-old infants' number sense. The experimenter was hidden behind the display and manipulated the objects through a trap door in the wall of the display. Five-month-old infants who saw the impossible event (only 1 Mickey Mouse doll) looked longer at the event than their 5-month-old counterparts who saw the possible event (2 dolls).



functioning and learning develop. The core knowledge approach argues that Piaget greatly underestimated the cognitive abilities of infants, especially young infants.

An intriguing domain of core knowledge that has been investigated in young infants is whether they have a sense of number. Spelke concludes that they do. Using the violation of expectations method discussed in this chapter's *Connecting Through Research*, Karen Wynn (1992) conducted an early experiment on infants' sense of number (see Figure 5.4). Five-month-old infants were shown one or two Mickey Mouse dolls on a puppet stage. Then the experimenter hid the doll(s) behind a screen and visibly removed or added one. Next, when the screen was lifted, the infants looked longer when they saw the incorrect number of dolls. Spelke and her colleagues (de Hevia & Spelke, 2010; Hyde & Spelke, 2009; Izard & Spelke, 2010; Lipton & Spelke, 2004; Spelke & Kinzler, 2007; Xu, Spelke, & Goddard, 2005) have found that infants can distinguish between different numbers of objects, actions, and sounds. Efforts to find further support for infants' sense of number are extending to assessments of brain activity. For example, a recent study of 3-month-olds observing changes either in the identity of objects or in the number of objects revealed that changes in the type of objects activated a region of the brain's temporal lobe while changes in the number of objects activated an additional region of the parietal lobe (Izard, Dehaene-Lambertz, & Dehaene, 2008). In older children and adults, number sense activates the same region of the parietal lobe activated in the 3-month-old infants in this study.

Of course, not everyone agrees with Spelke's conclusions about young infants' math skills (Cohen, 2002). One criticism is that infants in the number experiments are merely responding to changes in the display that violated their expectations.

In criticizing the core knowledge approach, British developmental psychologist Mark Johnson (2008) says that the infants Spelke assesses in her research already have accumulated hundreds, and in some cases even thousands, of hours of experience in grasping what the world is about, which gives considerable room for the environment's role in the development of infant cognition (Highfield, 2008). According to Johnson (2008), infants likely come into the world with "soft biases to perceive and attend to different aspects of the environment, and to learn about the world in particular ways." Although debate about the cause and course of infant cognitive development continues, most developmentalists today agree that Piaget underestimated the early cognitive accomplishments of infants and that both nature and nurture are involved in infants' cognitive development.

Conclusions In sum, many researchers conclude that Piaget wasn't specific enough about how infants learn about their world and that infants, especially young infants, are more competent than Piaget thought (Baillargeon & others, 2009a, b; Diamond, Casey, & Munakata, 2011; Spelke & Kinzler, 2009). As they have examined the specific ways that infants learn, the field of infant cognition has become very specialized. There are many researchers working on different questions, with no general theory emerging that can connect all of the different findings (Nelson, 1999). Their theories often are local theories, focused on specific research questions, rather than grand theories like Piaget's (Kuhn, 1998). If there is a unifying theme, it is that investigators in infant development seek to understand more precisely how developmental changes in cognition take place and the big issue of nature and nurture (Madole, Oakes, & Rakison, 2010; Richards, 2010; Woodward & Needham, 2009). As they seek to answer more precisely the contributions of nature and nurture to infant development, researchers face the difficult task of determining whether the course of acquiring information, which is very rapid in some domains, is best accounted for by an innate set of biases (that is, core knowledge), or by the extensive input of environmental experiences to which the infant is exposed (Aslin, 2009).

Review *Connect* Reflect

LG1 Summarize and evaluate Piaget's theory of infant development.

Review

- What cognitive processes are important in Piaget's theory?
- What are some characteristics of Piaget's stage of sensorimotor development?
- What are some contributions and criticisms of Piaget's sensorimotor stage?

Connect

- You just read that by the age of 6 to 8 months infants have learned to perceive gravity and support. What physical developments occurring around this same time period (discussed in Chapter 4) might contribute to infants' exploration and understanding of these concepts?

Reflect *Your Own Personal Journey of Life*

- What are some implications of Piaget's theory for parenting your own baby?

2 Learning, Remembering, and Conceptualizing

LG2 Describe how infants learn, remember, and conceptualize.

Conditioning

Attention

Memory

Imitation

Concept Formation and Categorization

When Piaget hung a doll above 4-month-old Lucienne's feet, as described in the chapter opening, did she remember the doll? If Piaget had rewarded her for moving the doll with her foot, would that have affected Lucienne's behavior? If he had showed her how to shake the doll's hand, could she have imitated him? If he had showed her a different doll, could she have formed the concept of a "doll"?

Questions like these might be examined by researchers taking the behavioral and social cognitive or information-processing approaches introduced in Chapter 1. In contrast to Piaget's theory, these approaches do not describe infant development in terms of stages. Instead, they document gradual changes in the infant's ability to understand and process information about the world (Diamond, Casey, &

developmental **connection**

Theories. The behavioral and social cognitive approaches emphasize continuity rather than discontinuity in development. Chapter 1, p. 21

Munakata, 2011; Madole, Oakes, & Rakison, 2010). In this section, we explore what researchers using these approaches can tell us about how infants learn, remember, and conceptualize.

CONDITIONING

In Chapter 1, we described Skinner's operant conditioning (in which the consequences of a behavior produce changes in the probability of the behavior's occurrence). For example, if an infant's behavior is followed by a rewarding stimulus, the behavior is likely to recur.

Operant conditioning has been especially helpful to researchers in their efforts to determine what infants perceive (Watanabe & Taga, 2006). For example, infants will suck faster on a nipple when the sucking behavior is followed by a visual display, music, or a human voice (Rovee-Collier, 1987, 2007).

Carolyn Rovee-Collier (1987) has also demonstrated how infants can retain information from the experience of being conditioned. In a characteristic experiment, she places a 2½-month-old baby in a crib under an elaborate mobile (see Figure 5.5). She then ties one end of a ribbon to the baby's ankle and the other end to the mobile. Subsequently, she observes that the baby kicks and makes the mobile move. The movement of the mobile is the reinforcing stimulus (which increases the baby's kicking behavior) in this experiment. Weeks later, the baby is returned to the crib, but its foot is not tied to the mobile. The baby kicks, which suggests it has retained the information that if it kicks a leg, the mobile will move.

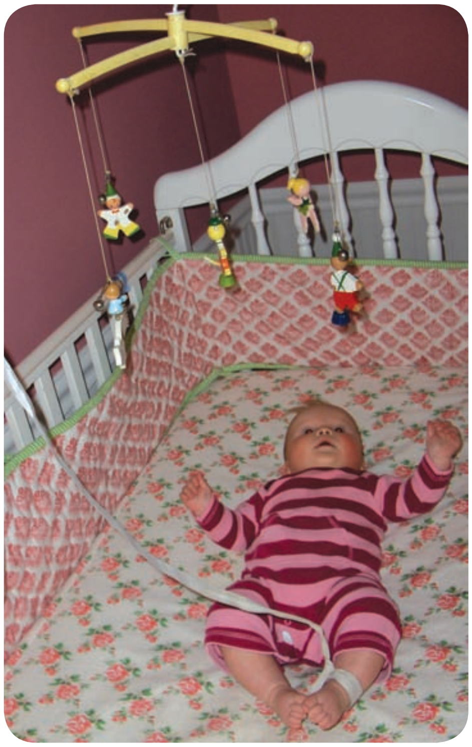


FIGURE **5.5**

THE TECHNIQUE USED IN ROVEE-COLLIER'S INVESTIGATION OF INFANT MEMORY. In Rovee-Collier's experiment, operant conditioning was used to demonstrate that infants as young as $2\frac{1}{2}$ months of age can retain information from the experience of being conditioned. *What did infants recall in Rovee-Collier's experiment?*

ATTENTION

Attention, the focusing of mental resources on select information, improves cognitive processing on many tasks. Even newborns can detect a contour and fix their attention on it. Older infants scan patterns more thoroughly. By 4 months, infants can selectively attend to an object. In adults, when individuals orient their attention to an object or event, the parietal lobes in the cerebral cortex are involved (Posner, 2003). It is likely that the parietal lobes are active when infants orient their attention, although research has not yet documented this. (Figure 4.4 in the previous chapter illustrates the location of the parietal lobes in the brain.)

Attention in the first year of life is dominated by an *orienting/investigative process* (Posner & Rothbart, 2007). This process involves directing attention to potentially important locations in the environment (that is, *where*) and recognizing objects and their features (such as color and form) (that is, *what*) (Richards, 2010). From 3 to 9 months of age, infants can deploy their attention more flexibly and quickly. Another important type of attention is *sustained attention*, also referred to as *focused attention* (Richards, 2010). New stimuli typically elicit an orienting response followed by sustained attention. It is sustained attention that allows infants to learn about and remember characteristics of a stimulus as it becomes familiar. Researchers have found that infants as young as 3 months of age engage in 5 to 10 seconds of sustained attention. From this age through the second year, the length of sustained attention increases (Courage & Richards, 2008).

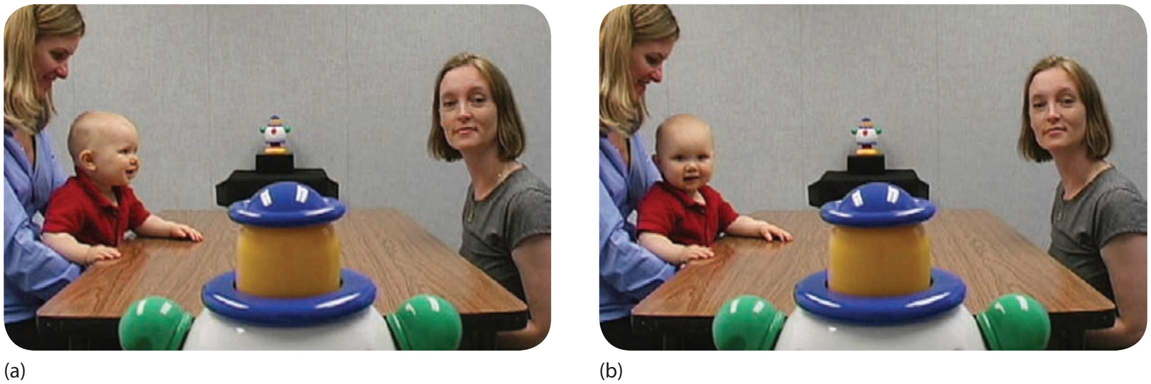
> I wish I could travel down by the road that crosses the baby's mind where reason makes kites of her laws and flies them. . . .
>
> —Rabindranath Tagore
>
> *Bengali Poet, Essayist, 20th Century*

developmental **connection**

Attention. In early childhood, children make significant advances in sustained attention. Chapter 7, p. 224

attention The focusing of mental resources on select information.

Habituation and Dishabituation Closely linked with attention are the processes of habituation and dishabituation that we discussed in Chapter 4 (Colombo, Kapa, & Curtendale, 2010). If you say the same word or show the same toy to a baby several times in a row, the baby usually pays less attention to it each time. This is *habituation*—decreased responsiveness to a stimulus after repeated presentations of the stimulus. *Dishabituation* is the increase in responsiveness after a change in stimulation. Chapter 4 described some of the measures that researchers use to study whether habituation is occurring, such as sucking behavior (sucking stops


(a)

(b)

FIGURE **5.6**

GAZE FOLLOWING IN INFANCY. Researcher Rechele Brooks shifts her eyes from the infant to a toy in the foreground (*a*). The infant then follows her eye movement to the toy (*b*). Brooks and colleague Andrew Meltzoff (2005) found that infants begin to engage in this kind of behavior called "gaze following" at 10 to 11 months of age. *Why might gaze following be an important accomplishment for an infant?*

when an infant attends to a novel object), heart rates, and the length of time the infant looks at an object.

Infants' attention is strongly governed by novelty and habituation (Courage & Richards, 2008; Richards, 2010). When an object becomes familiar, attention becomes shorter, and infants become more vulnerable to distraction (Oakes, Kannass, & Shaddy, 2002). One study found that 10-month-olds were more distractible than 26-month-olds (Ruff & Capozzoli, 2003). Another study revealed that infants who were labeled "short lookers" because of the brief time they focused attention had better memory at 1 year of age than did "long lookers," who had more sustained attention (Courage, Howe, & Squires, 2004).

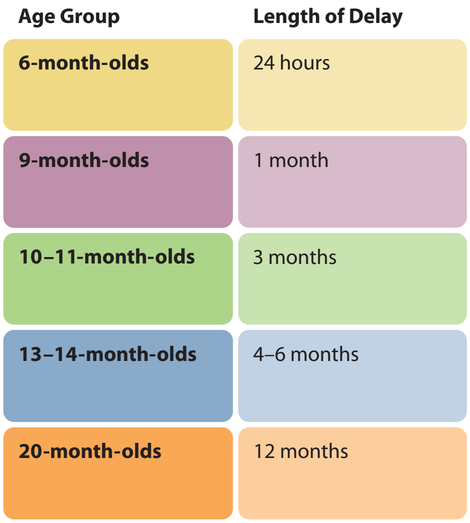
Researchers study habituation to determine the extent to which infants can see, hear, smell, taste, and experience touch (Slater, Field, & Hernandez-Reif, 2007). Studies of habituation can also indicate whether infants recognize something they have previously experienced. Habituation provides a measure of an infant's maturity and well-being. Infants who have brain damage do not habituate well.

Knowing about habituation and dishabituation can help parents interact effectively with infants. Infants respond to changes in stimulation. Wise parents sense when an infant shows an interest and realize that they may have to repeat something many times for the infant to process information. But, if the stimulation is repeated often, the infant stops responding to the parent. In parent-infant interaction, it is important for parents to do novel things and to repeat them often until the infant stops responding. The parent stops or changes behaviors when the infant redirects his or her attention (Rosenblith, 1992).

This young infant's attention is riveted on the red block. The young infant's attention to the toy will be strongly regulated by the processes of habituation and dishabituation. *What characterizes these processes?*

Joint Attention Another aspect of attention that is an important aspect of infant development is **joint attention,** in which individuals focus on the same object or event. Joint attention requires (1) an ability to track another's behavior, such as following the gaze of someone; (2) one person's directing another's attention, and (3) reciprocal interaction (Butterworth, 2004). Early in infancy, joint attention involves a caregiver pointing, turning the infant's head, snapping one's fingers, or using words to direct an infant's attention. Emerging forms of joint attention occur at about 7 to 8 months, but it is not until toward the end of the first year that joint attention skills are frequently observed (Heimann & others, 2006). In a study conducted by Rechele Brooks and Andrew Meltzoff (2006), at 10 to 11 months of age infants first began engaging in "gaze following," looking where another person has just looked (see Figure 5.6). And by their first birthday, infants have begun to direct adults' attention to objects that capture their interest (Heimann & others, 2006).

joint attention Process that occurs when individuals focus on the same object and an ability to track another's behavior is present, one individual directs another's attention, and reciprocal interaction is present.



Age Group	Length of Delay
6-month-olds	24 hours
9-month-olds	1 month
10–11-month-olds	3 months
13–14-month-olds	4–6 months
20-month-olds	12 months

FIGURE **5.7**

AGE-RELATED CHANGES IN THE LENGTH OF TIME OVER WHICH MEMORY OCCURS

Source: Bauer (2009a).

Joint attention plays important roles in many aspects of infant development and considerably increases infants' ability to learn from other people (Colombo, Kapa, & Curtendale, 2010). Nowhere is this more apparent than in observations of interchanges between caregivers and infants as infants are learning language (Meltzoff & Brooks, 2009). When caregivers and infants frequently engage in joint attention, infants say their first word earlier and develop a larger vocabulary (Carpenter, Nagell, & Tomasello, 1998; Flom & Pick, 2003; Tomasello, 2008). In one study, infants' initiation of joint attention was linked to their receptive and expressive language at 3 years of age (Ulvund & Smith, 1996). Later in the chapter in our discussion of language, we will further discuss joint attention and the infant's language development.

MEMORY

Memory involves the retention of information over time. Attention plays an important role in memory as part of a process called *encoding,* which is the process by which information gets into memory. What can infants remember, when?

Some researchers such as Rovee-Collier (2008) have concluded that infants as young as 2 to 6 months of age can remember some experiences through 1½ to 2 years of age. However, critics such as Jean Mandler (2004), a leading expert on infant cognition, argue that the infants in Rovee-Collier's experiments are displaying only implicit memory. **Implicit memory** refers to memory without conscious recollection—memories of skills and routine procedures that are performed automatically. In contrast, **explicit memory** refers to the conscious memory of facts and experiences.

When people think about memory, they are usually referring to explicit memory. Most researchers find that babies do not show explicit memory until the second half of the first year (Bauer, 2007, 2009a). Then, explicit memory improves substantially during the second year of life (Bauer, 2007, 2009; Kolling & others, 2010). In one longitudinal study, infants were assessed several times during their second year (Bauer & others, 2000). Older infants showed more accurate memory and required fewer prompts to demonstrate their memory than younger infants. Figure 5.7 summarizes how long researchers have found infants of different ages can remember information (Bauer, 2009a). As indicated in Figure 5.7, researchers have documented that 6-month-olds can remember information for 24 hours but by 20 months of age infants can remember information they encountered 12 months earlier.

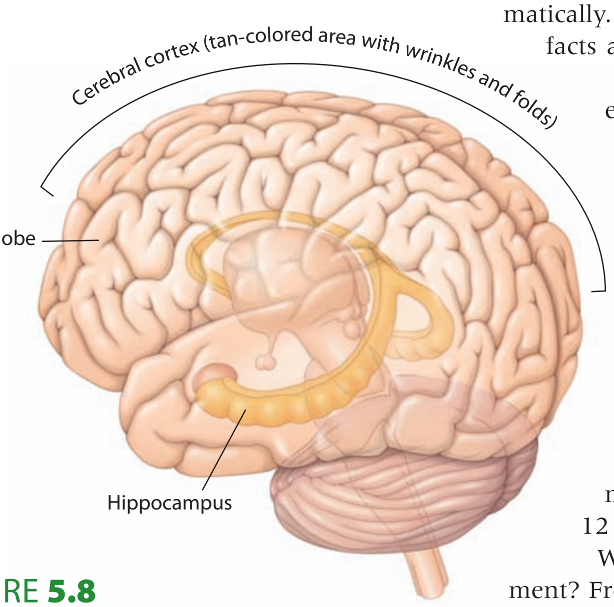


FIGURE **5.8**

KEY BRAIN STRUCTURES INVOLVED IN EXPLICIT MEMORY DEVELOPMENT IN INFANCY

What changes in the brain are linked to infants' memory development? From about 6 to 12 months of age, the maturation of the hippocampus and the surrounding cerebral cortex, especially the frontal lobes, make the emergence of explicit memory possible (Nelson, Thomas, & de Haan, 2006) (see Figure 5.8). Explicit memory continues to improve in the second year, as these brain structures further mature and connections between them increase. Less is known about the areas of the brain involved in implicit memory in infancy.

Let's examine another aspect of memory. Do you remember your third birthday party? Probably not. Most adults can remember little if anything from their first three years of life. This is called *infantile* or *childhood amnesia.* The few reported adult memories of life at age 2 or 3 are at best very sketchy (Fivush, 2011; Newcombe, 2008; Sabbagh, 2009). Elementary school children also do not remember much of their early child years (Lie & Newcombe, 1999).

What is the cause of infantile amnesia? One reason older children and adults have difficulty recalling events from their infant and early child years is that during these early years the prefrontal lobes of the brain are immature; this area of the

memory A central feature of cognitive development, pertaining to all situations in which an individual retains information over time.

implicit memory Memory without conscious recollection; involves skills and routine procedures that are automatically performed.

explicit memory Memory of facts and experiences that individuals consciously know and can state.

brain is believed to play an important role in storing memories for events (Boyer & Diamond, 1992).

In sum, most of young infants' conscious memories appear to be rather fragile and short-lived, although their implicit memory of perceptual-motor actions can be substantial (Bauer, 2007, 2009; Mandler, 2004). By the end of the second year, long-term memory is more substantial and reliable (Bauer, 2007, 2009).

IMITATION

Can infants imitate someone else's emotional expressions? If an adult smiles, will the baby follow with a smile? If an adult protrudes her lower lip, wrinkles her forehead, and frowns, will the baby show a sad face?

Infant development researcher Andrew Meltzoff (2004, 2005, 2007; Meltzoff & Moore, 1999; Meltzoff & Williamson, 2008) has conducted numerous studies of infants' imitative abilities. He sees infants' imitative abilities as biologically based, because infants can imitate a facial expression within the first few days after birth. He also emphasizes that the infant's imitative abilities do not resemble a hardwired response but rather involve flexibility and adaptability. In Meltzoff's observations of infants across the first 72 hours of life, the infants gradually displayed more complete imitation of an adult's facial expression, such as protruding the tongue or opening the mouth wide (see Figure 5.9).

FIGURE **5.9**

INFANT IMITATION. Infant development researcher Andrew Meltzoff protrudes his tongue in an attempt to get the infant to imitate his behavior. *How do Meltzoff's findings about imitation compare with Piaget's descriptions of infants' abilities?*

Meltzoff (2007) concludes that infants don't blindly imitate everything they see and often make creative errors. He also argues that beginning at birth there is an interplay between learning by observing and learning by doing (Piaget emphasized learning by doing).

Not all experts on infant development accept Meltzoff's conclusions that newborns are capable of imitation. Some say that these babies were engaging in little more than automatic responses to a stimulus.

Meltzoff (2005) also has studied **deferred imitation,** which occurs after a time delay of hours or days. Piaget held that deferred imitation doesn't occur until about 18 months of age. Meltzoff's research suggested that it occurs much earlier. In one study, Meltzoff (1988) demonstrated that 9-month-old infants could imitate actions—such as pushing a recessed button in a box, which produced a beeping sound—that they had seen performed 24 hours earlier. Also, in a recent study, engagement in deferred imitation at 9 months of age was a strong predictor of more extensive production of communicative gestures at 14 months of age (Heimann & others, 2006). Two of the most common infant gestures are (1) extending the arm to show caregiver something the infant is holding, and (2) pointing with the arm and index finger extended at some interesting object or event.

CONCEPT FORMATION AND CATEGORIZATION

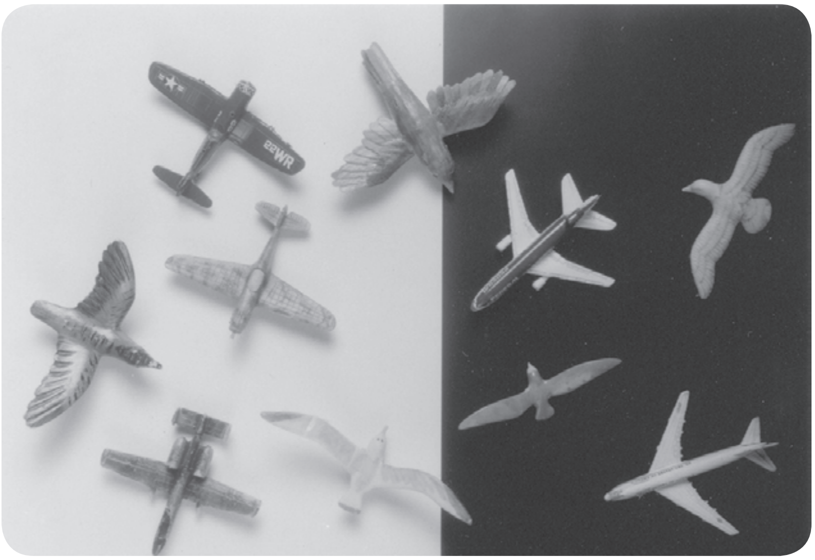
Along with attention, memory, and imitation, concepts are key aspects of infants' cognitive development (Madole, Oakes, & Rakison, 2010; Quinn & others, 2010; Schultz, 2010). To understand what concepts are, we first have to define *categories:* They group objects, events, and characteristics on the basis of common properties. *Concepts* are ideas about what categories represent, or said another way, the sort of thing we think category members are. Concepts and categories help us to simplify and summarize information. Without concepts, you would see each object and event as unique; you would not be able to make any generalizations.

Do infants have concepts? Yes, they do, although we do not know just how early concept formation begins (Mandler, 2009; Quinn & others, 2010). Using

deferred imitation Imitation that occurs after a delay of hours or days.

FIGURE **5.10**

CATEGORIZATION IN 9- TO 11-MONTH-OLDS. These are the stimuli used in the study that indicated 9- to 11-month-old infants categorized birds as animals and airplanes as vehicles even though the objects were perceptually similar (Mandler & McDonough, 1993).



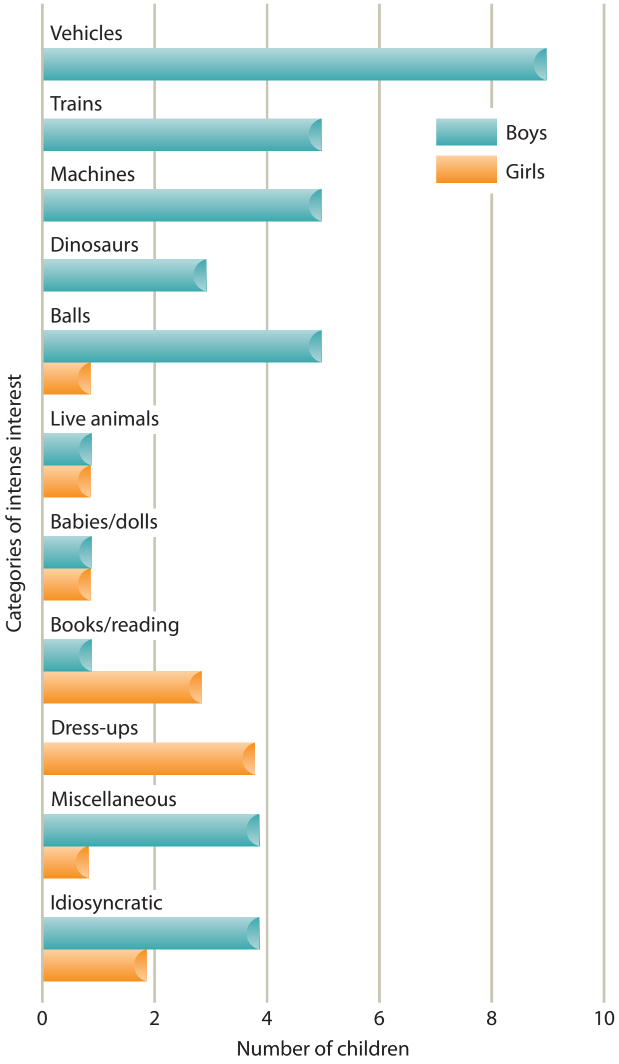


FIGURE **5.11**

CATEGORIZATION OF BOYS' AND GIRLS' INTENSE INTERESTS

habituation experiments like those described earlier in the chapter, some researchers have found that infants as young as 3 months of age can group together objects with similar appearances (Quinn, 2009; Quinn & others, 2009). This research capitalizes on the knowledge that infants are more likely to look at a novel object than a familiar object. For example, in a characteristic study young infants are shown a series of photographs of different types of cats in pairs (Quinn & Eimas, 1996). As they are shown more pictures of cats, they habituate to the animals, looking at them less and less. Then, after seeing a series of cats paired in photographs, when they are shown a photograph of a cat paired with a photograph of a dog, they take a longer look at the dog, indicating an ability to group together objects characterized by similar properties.

Jean Mandler (2004, 2009) argues that these early categorizations are best described as *perceptual categorization*. That is, the categorizations are based on similar perceptual features of objects, such as size, color, and movement, as well as parts of objects, such as legs for animals. Mandler (2004) concludes that it is not until about 7 to 9 months of age that infants form *conceptual* categories rather than just making perceptual discriminations between different categories. In one study of 9- to 11-month-olds, infants classified birds as animals and airplanes as vehicles even though the objects were perceptually similar—airplanes and birds with their wings spread (Mandler & McDonough, 1993) (see Figure 5.10).

Further advances in categorization occur in the second year of life (Booth, 2006). Many infants' "first concepts are broad and global in nature, such as 'animal' or 'indoor thing.' Gradually, over the first two years these broad concepts become more differentiated into concepts such as 'land animal,' then 'dog,' or to 'furniture,' then 'chair'" (Mandler, 2006, p. 1). Also in the second year, infants often categorize objects on the basis of their shape (Landau, Smith, & Jones, 1998).

Do some very young children develop an intense, passionate interest in a particular category of objects or activities? A recent study confirmed that they do (DeLoache, Simcock, & Macari, 2007). A striking finding was the large gender difference in categories with an extreme intense interest in particular categories stronger for boys than girls. Categorization of boys' intense interests focused on vehicles, trains, machines, dinosaurs, and balls; girls' intense interests

Infants are creating concepts and organizing their world into conceptual domains that will form the backbone of their thought throughout life.

—Jean Mandler

Contemporary Psychologist, University of California-San Diego were more likely to involve dress-ups and books/reading (see Figure 5.11). When your author's grandson Alex was 18 to 24 months old, he already had developed an intense, passionate interest in the category of vehicles. For example, at this age, he categorized vehicles into such subcategories as cars, trucks, earth-moving equipment, and buses. In addition to common classifications of cars into police cars, jeeps, taxis, and such, and trucks into firetrucks, dump trucks, and the like, his categorical knowledge of earth-moving equipment included bulldozers and excavators, and he categorized buses into school buses, London buses, and funky Malta buses (retro buses on the island of Malta). Later, at 2 to 3 years of age, Alex developed an intense, passionate interest in categorizing dinosaurs.

In sum, the infant's advances in processing information—through attention, memory, imitation, and concept formation—is much richer, more gradual and less stage-like, and occurs earlier than was envisioned by earlier theorists, such as Piaget (Diamond, Casey, & Munakata, 2011; Oakes & others, 2010; Spelke & Kinzler, 2009). As leading infant researcher Jean Mandler (2004) concluded, "The human infant shows a remarkable degree of learning power and complexity in what is being learned and in the way it is represented" (p. 304).

The author's grandson Alex at 2 years of age showing his intense, passionate interest in the category of vehicles while playing with a London taxi and a funky Malta bus.

Review *Connect* Reflect

LG2 Describe how infants learn, remember, and conceptualize.

Review

- How do infants learn through conditioning?
- What is attention? What characterizes attention in infants?
- To what extent can infants remember?
- How is imitation involved in infant learning?
- When do infants develop concepts, and how does concept formation change during infancy?

Connect

- In this section, we learned that explicit memory improves in the second year as the hippocampus and frontal lobes mature and as connections between them increase. What did you learn in the text associated with Figure 4.6 in the previous chapter that might also contribute to improvements in a mental process such as memory during this same time frame?

Reflect *Your Own Personal Journey of Life*

- If a friend told you that she remembers being abused by her parents when she was 2 years old, would you believe her? Explain your answer.

3 Individual Differences and Assessment

LG3 Discuss infant assessment measures and the prediction of intelligence.

Measures of Infant Development

Predicting Intelligence

So far, we have discussed how the cognitive development of infants generally progresses. We have emphasized what is typical of the largest number of infants or the average infant, but the results obtained for *most* infants do not apply to *all* infants. It is advantageous to know whether an infant is developing at a slow, normal, or advanced pace during the course of infancy. If an infant advances at an especially slow rate, then some form of enrichment may be necessary. If an infant develops at an advanced pace, parents may be advised to provide toys that stimulate cognitive growth in slightly older infants. How is an infant's cognitive development assessed?

connecting with careers

Toosje Thyssen Van Beveren, Infant Assessment Specialist

Toosje Thyssen Van Beveren is a developmental psychologist at the University of Texas Medical Center in Dallas. She has a master's degree in child clinical psychology and a Ph.D. in human development. Currently, Van Beveren is involved in a 12-week program called New Connections, which is a comprehensive intervention for young children who were affected by substance abuse prenatally and for their caregivers.

In the New Connections program, Van Beveren assesses infants' developmental status and progress. She might refer the infants to a speech, physical, or occupational therapist and monitor the infants' services and progress. Van Beveren trains the program staff and encourages them to use the exercises she recommends. She also discusses the child's problems with the primary caregivers, suggests activities, and assists them in enrolling infants in appropriate programs.

Toosje Thyssen Van Beveren conducting an infant assessment.

During her graduate work at the University of Texas at Dallas, Van Beveren was author John Santrock's teaching assistant in his undergraduate course on life-span development for four years. As a teaching assistant, she attended classes, graded exams, counseled students, and occasionally gave lectures. Each semester, Van Beveren returns to give a lecture on prenatal development and infancy. She also teaches part-time in the psychology department at UT–Dallas. In Van Beveren's words, "My days are busy and full. The work is often challenging. There are some disappointments but mostly the work is enormously gratifying."

MEASURES OF INFANT DEVELOPMENT

Individual differences in infant cognitive development have been studied primarily through the use of developmental scales or infant intelligence tests. For example, in Chapter 3 we discussed the Brazelton Neonatal Behavioral Assessment Scale (NBAS) and the Neonatal Intensive Care Unit Network Neurobehavioral Scale (NNNS), which are used to evaluate newborns. To read about the work of one infant assessment specialist, see *Connecting With Careers*.

The most important early contributor to the testing of infants was Arnold Gesell (1934). He developed a measure that helped sort out babies with normal functioning from ones with abnormal functioning. This was especially useful to adoption agencies, which had large numbers of babies awaiting placement. Gesell's examination was used widely for many years and still is frequently employed by pediatricians to distinguish normal and abnormal functioning in infants. The current version of the Gesell test has four categories of behavior: motor, language, adaptive, and personal-social. The **developmental quotient (DQ),** combines subscores in these categories to provide an overall score.

The widely used **Bayley Scales of Infant Development,** were developed by Nancy Bayley (1969) in order to assess infant behavior and predict later development. The current version, Bayley-III, has five scales: cognitive, language, motor, socioemotional, and adaptive (Bayley, 2006). The first three scales are administered directly to the infant while the latter two are questionnaires given to the caregiver. The Bayley-III also is more appropriate for use in clinical settings than were the two previous editions (Lennon & others, 2008).

developmental quotient (DQ) An overall score that combines subscores in motor, language, adaptive, and personal-social domains in the Gesell assessment of infants.

Bayley Scales of Infant Development Scales developed by Nancy Bayley that are widely used in the assessment of infant development. The current version has three components: a mental scale, a motor scale, and an infant behavior profile.

How should a 6-month-old perform on the Bayley mental scale? The 6-month-old infant should be able to vocalize pleasure and displeasure, persistently search for objects that are just out of immediate reach, and approach a mirror that is placed in front of the infant by the examiner. By 12 months of age, the infant should be able to inhibit behavior when commanded to do so, imitate words the examiner says (such as *Mama*), and respond to simple requests (such as "Take a drink").

The explosion of interest in infant development has produced many new measures, especially tasks that evaluate the ways infants process information (Rose, Feldman, & Wallace, 1992). The Fagan Test of Infant Intelligence is increasingly being used (Fagan, 1992). This test focuses on the infant's ability to process information in such ways as encoding the attributes of objects, detecting similarities and differences between objects, forming mental representations, and retrieving these representations. For example, to estimate intelligence, it uses the amount of time babies look at a new object compared with the amount of time they spend looking at a familiar object.

Items in the Bayley-III Scales of Infant Development.

PREDICTING INTELLIGENCE

The infant-testing movement grew out of the tradition of IQ testing. However, IQ tests of older children pay more attention to verbal ability. Tests for infants contain far more items related to perceptual-motor development and include measures of social interaction.

Overall scores on such tests as the Gesell and the Bayley scales do not correlate highly with IQ scores obtained later in childhood. This result is not surprising because the components tested in infancy are not the same as the components tested by IQ tests.

Unlike the Gesell and Bayley scales, the Fagan test is correlated with measures of intelligence in older children. In fact, evidence is accumulating that measures of habituation and dishabituation are linked to intelligence in childhood, adolescence, and even adulthood (Fagan, Holland, & Wheeler, 2007; Kavsek, 2004). One recent study revealed that habituation assessed at 3 or 6 months of age was linked to verbal skills and intelligence assessed at 32 months of age (Domsch, Lohaus, & Thomas, 2009). It is important, however, not to go too far and think that connections between cognitive development in early infancy and later cognitive development are so strong that no discontinuity takes place. Some important changes in cognitive development occur after infancy, changes that we will describe in later chapters.

developmental **connection**

Intelligence. Tests that assess older children's intelligence use more verbal items than do developmental assessments of infants. Chapter 9, p. 294

Review *Connect* Reflect

LG3 Discuss infant assessment measures and the prediction of intelligence.

Review

- What are some measures of infant development?
- Do tests of infants predict intelligence later in life?

Connect

- In this section, you learned that measures of habituation and dishabituation are linked to intelligence. In Section 2 of this chapter, what advice was given to parents regarding habituation and dishabituation?

Reflect *Your Own Personal Journey of Life*

- Imagine that you had your 1-year-old assessed with a developmental scale, and the baby did very well on it. How confident should you be that your baby is going to be a genius when he or she grows up?

4 Language Development

LG4 Describe the nature of language and how it develops in infancy.

- Defining Language
- Language's Rule Systems
- How Language Develops
- Biological and Environmental Influences
- An Interactionist View

In 1799, a nude boy was observed running through the woods in France. The boy was captured when he was 11 years old. He was called the Wild Boy of Aveyron and was believed to have lived in the woods alone for six years (Lane, 1976). When found, he made no effort to communicate. He never learned to communicate effectively. Sadly, a modern-day wild child named Genie was discovered in Los Angeles in 1970. Despite intensive intervention, Genie has never acquired more than a primitive form of language. Both cases—the Wild Boy of Aveyron and Genie—raise questions about the biological and environmental determinants of language, topics that we also will examine later in the chapter. First, though, we need to define language.

Language allows us to communicate with others. *What are some important characteristics of language?*

DEFINING LANGUAGE

Language is a form of communication—whether spoken, written, or signed—that is based on a system of symbols. Language consists of the words used by a community and the rules for varying and combining them.

Think how important language is in our everyday lives. We need language to speak with others, listen to others, read, and write. Our language enables us to describe past events in detail and to plan for the future. Language lets us pass down information from one generation to the next and create a rich cultural heritage.

All human languages have some common characteristics (Berko Gleason, 2009). These include infinite generativity and organizational rules. **Infinite generativity** is the ability to produce an endless number of meaningful sentences using a finite set of words and rules. Rules describe the way language works (Berko Gleason, 2009). Let's explore what these rules involve.

LANGUAGE'S RULE SYSTEMS

When nineteenth-century American writer Ralph Waldo Emerson said, "The world was built in order, and the atoms march in tune," he must have had language in mind. Language is highly ordered and organized (Berko Gleason, 2009; Bohannon & Bonvillian, 2009). The organization involves five systems of rules: phonology, morphology, syntax, semantics, and pragmatics.

Phonology Every language is made up of basic sounds. **Phonology** is the sound system of the language, including the sounds that are used and how they may be combined (Menn & Stoel-Gammon, 2009). For example, English has the initial consonant cluster *spr* as in *spring,* but no words begin with the cluster *rsp.*

Phonology provides a basis for constructing a large and expandable set of words out of two or three dozen phonemes. A *phoneme* is the basic unit of sound in a language; it is the smallest unit of sound that affects meaning. For example, in English the sound represented by the letter *p*, as in the words *pot* and *spot,* is a phoneme. The /p/ sound is slightly different in the two words, but this variation is not distinguished in English, and therefore the /p/ sound is a single phoneme. In some languages, such as Hindi, the variations of the /p/ sound represent separate phonemes.

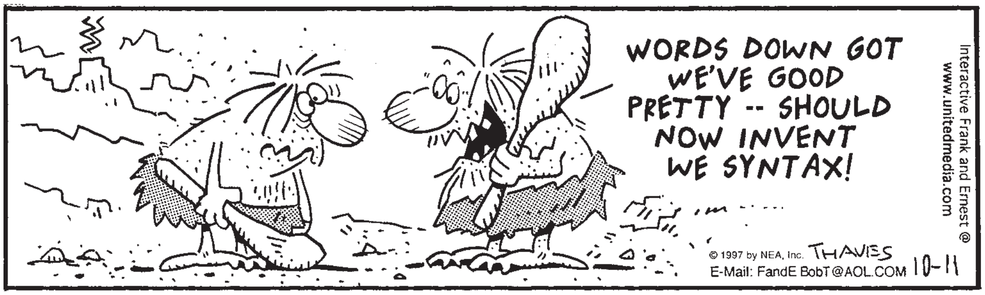
Morphology **Morphology** refers to the units of meaning involved in word formation. A *morpheme* is a minimal unit of meaning; it is a word or a part of a word

language A form of communication, whether spoken, written, or signed, that is based on a system of symbols. Language consists of the words used by a community and the rules for varying and combining them.

infinite generativity The ability to produce an endless number of meaningful sentences using a finite set of words and rules.

phonology The sound system of the language, including the sounds that are used and how they may be combined.

morphology Units of meaning involved in word formation.


WORDS DOWN GOT WE'VE GOOD PRETTY -- SHOULD NOW INVENT WE SYNTAX!
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that cannot be broken into smaller meaningful parts. Every word in the English language is made up of one or more morphemes. Some words consist of a single morpheme (for example, *help*), whereas others are made up of more than one morpheme (for example, *helper* has two morphemes, *help* + *er*, with the morpheme *-er* meaning "one who," in this case "one who helps"). Thus, not all morphemes are words by themselves; for example, *pre-*, *-tion,* and *-ing* are morphemes.

Just as the rules that govern phonology describe the sound sequences that can occur in a language, the rules of morphology describe the way meaningful units (morphemes) can be combined in words (Tager-Flusberg & Zukowski, 2009). Morphemes have many jobs in grammar, such as marking tense (for example, she walks versus she walked) and number (she walks versus they walk).

Syntax **Syntax** involves the way words are combined to form acceptable phrases and sentences (Tager-Flusberg & Zukowski, 2009). If someone says to you, "Bob slugged Tom" or "Bob was slugged by Tom," you know who did the slugging and who was slugged in each case because you have a syntactic understanding of these sentence structures. You also understand that the sentence, "You didn't stay, did you?" is a grammatical sentence, but that "You didn't stay, didn't you? is unacceptable and ambiguous.

If you learn another language, English syntax will not get you very far. For example, in English an adjective usually precedes a noun (as in *blue sky*), whereas in Spanish the adjective usually follows the noun (*cielo azul*). Despite the differences in their syntactic structures, however, syntactic systems in all the world's languages have some common ground (Saffran, 2009). For example, no language we know of permits sentences like the following one:

> *The mouse the cat the farmer chased killed ate the cheese.*

It appears that language users cannot process subjects and objects arranged in too complex a fashion in a sentence.

Semantics **Semantics** refers to the meaning of words and sentences. Every word has a set of semantic features, which are required attributes related to meaning. *Girl* and *woman*, for example, share many semantic features, but they differ semantically in regard to age.

Words have semantic restrictions on how they can be used in sentences (Li, 2009; Pan & Uccelli, 2009). The sentence *The bicycle talked the boy into buying a candy bar* is syntactically correct but semantically incorrect. The sentence violates our semantic knowledge that bicycles don't talk.

Pragmatics A final set of language rules involves **pragmatics,** the appropriate use of language in different contexts. Pragmatics covers a lot of territory (Bryant, 2009). When you take turns speaking in a discussion or use a question to convey a command ("Why is it so noisy in here?" What is this, Grand Central Station?"), you are demonstrating knowledge of pragmatics. You also apply the pragmatics of English when you use polite language in appropriate situations (for example, when

syntax The ways words are combined to form acceptable phrases and sentences.

semantics The meaning of words and sentences.

pragmatics The appropriate use of language in different contexts.

Rule System	Description	Examples
Phonology	The sound system of a language. A phoneme is the smallest sound unit in a language.	The word *chat* has three phonemes or sounds: /ch/ /ā/ /t/. An example of phonological rule in the English language is while the phoneme /r/ can follow the phonemes /t/ or /d/ in an English consonant cluster (such as *track* or *drab*), the phoneme /l/ cannot follow these letters.
Morphology	The system of meaningful units involved in word formation.	The smallest sound units that have a meaning are called morphemes, or meaning units. The word *girl* is one morpheme, or meaning unit; it cannot be broken down any further and still have meaning. When the suffix *s* is added, the word becomes *girls* and has two morphemes because the *s* changed the meaning of the word, indicating that there is more than one girl.
Syntax	The system that involves the way words are combined to form acceptable phrases and sentences.	Word order is very important in determining meaning in the English language. For example, the sentence "Sebastian pushed the bike" has a different meaning than "The bike pushed Sebastian."
Semantics	The system that involves the meaning of words and sentences.	Knowing the meaning of individual words—that is, vocabulary. For example, semantics includes knowing the meaning of such words as *orange*, *transportation*, and *intelligent*.
Pragmatics	The system of using appropriate conversation and knowledge of how to effectively use language in context.	An example is using polite language in appropriate situations, such as being mannerly when talking with one's teacher. Taking turns in a conversation involves pragmatics.

FIGURE **5.12**

THE RULE SYSTEMS OF LANGUAGE

talking to one's teacher) or tell stories that are interesting, jokes that are funny, and lies that convince. In each of these cases, you are demonstrating that you understand the rules of your culture for adjusting language to suit the context.

At this point, we have discussed five important rule systems involved in language. An overview of these rule systems is presented in Figure 5.12.

HOW LANGUAGE DEVELOPS

According to an ancient historian, in the thirteenth century the emperor of Germany, Frederick II, had a cruel idea. He wanted to know what language children would speak if no one talked to them. He selected several newborns and threatened their caregivers with death if they ever talked to the infants. Frederick never found out what language the children spoke because they all died. Today, we are still curious about infants' development of language, although our experiments and observations are, to say the least, far more humane than the evil Frederick's.

Whatever language they learn, infants all over the world follow a similar path in language development. What are some key milestones in this development?

FIGURE **5.13**

FROM UNIVERSAL LINGUIST TO LANGUAGE-SPECIFIC LISTENER. In Patricia Kuhl's research laboratory babies listen to tape-recorded voices that repeat syllables. When the sounds of the syllables change, the babies quickly learn to look at the bear. Using this technique, Kuhl has demonstrated that babies are universal linguists until about 6 months of age, but in the next six months become language-specific listeners. *Does Kuhl's research give support to the view that either "nature" or "nurture" is the source of language acquisition?*

Recognizing Language Sounds Long before they begin to learn words, infants can make fine distinctions among the sounds of the language (Sachs, 2009). In Patricia Kuhl's (1993, 2000, 2007; Kuhl & Damasio, 2009; Kuhl & others, 2006) research, phonemes from languages all over the world are piped through a speaker for infants to hear (see Figure 5.13). A box with a toy bear in it is placed where the infant can see it. A string of identical syllables is played; then the syllables are changed (for example, *ba ba ba ba*, and then *pa pa pa pa*). If the infant turns its head when the syllables change, the box lights up and the bear dances and drums, rewarding the infant for noticing the change.

Kuhl's (2007) research has demonstrated that from birth up to about 6 months of age, infants are "citizens of the world": They recognize when sounds change most of the time, no matter what language the syllables come from. But over the next six months, infants get even better at perceiving the changes in sounds from their "own" language (the one their parents speak) and gradually lose the ability to recognize differences that are not important in their own language.

Infants must fish out individual words from the nonstop stream of sound that makes up ordinary speech (Jusczyk, 2000). To do so, they must find the boundaries between words, which is very difficult for infants because adults don't pause between words when they speak. Still, infants begin to detect word boundaries by 8 months of age. For example, in one study, 8-month-old infants listened to recorded stories that contained unusual words, such as *hornbill* and *python* (Jusczyk & Hohne, 1997). Two weeks later, the researchers tested the infants with two lists of words, one made up of words in the stories, the other of new, unusual words that did not appear in the stories. The infants listened to the familiar words for a second longer, on average, than to new words.

Long before infants speak recognizable words, they communicate by producing a number of vocalizations and gestures. *At approximately what ages do infants begin to produce different types of vocalization and gestures?*

Babbling and Other Vocalizations Long before infants speak recognizable words, they produce a number of vocalizations (Sachs, 2009). The functions of these early vocalizations are to practice making sounds, to communicate, and to attract attention (Lock, 2004). Babies' sounds go through this sequence during the first year:

- *Crying.* Babies cry even at birth. Crying can signal distress, but, as we will discuss in Chapter 6, there are different types of cries that signal different things.
- *Cooing.* Babies first coo at about 2 to 4 months (Menn & Stoel-Gannon, 2009). These are gurgling sounds that are made in the back of the throat and usually express pleasure during interaction with the caregiver.
- *Babbling.* In the middle of the first year, babies babble—that is, they produce strings of consonant-vowel combinations, such as "ba, ba, ba, ba."

Gestures Infants start using gestures, such as showing and pointing, at about 8 to 12 months of age. They may wave bye-bye, nod to mean "yes," show an empty cup to want more milk, and point to a dog to draw attention to it. Some early gestures are symbolic, as when an infant smacks her lips to indicate food/drink. Pointing is considered by language experts as an important index of the social aspects of language, and it follows this developmental sequence: from pointing without checking on adult gaze to pointing while looking back and forth between an object and the adult (Goldin-Meadow, 2010; Rowe & Goldin-Meadow, 2009a). Lack of pointing is a significant indicator of problems in the infant's communication system. For example, failure to engage in pointing characterizes many autistic children.

A recent study found that parents in high socioeconomic status (SES) families were more likely to use gestures when communicating with their 14-month-old infants (Rowe & Goldin-Meadow, 2009b). Further, the infants' use of gestures at 14 months of age in high SES families was linked to a larger vocabulary at 54 months of age.

First Words Children understand their first words earlier than they speak them (Pan & Uccelli, 2009). As early as 5 months of age, infants recognize their name when someone says it. On the average, infants understand about 50 words at about 13 months, but they can't say this many words until about 18 months (Menyuk, Liebergott, & Schultz, 1995). Thus, in infancy *receptive vocabulary* (words the child understands) considerably exceeds *spoken vocabulary* (words the child uses).

A child's first words include those that name important people (*dada*), familiar animals (*kitty*), vehicles (*car*), toys (*ball*), food (*milk*), body parts (*eye*), clothes (*hat*), household items (*clock*), and greeting terms (*bye*). These were the first words of babies 50 years ago, and they are the first words of babies today. Children often express various intentions with their single words, so that "cookie" might mean, "That's a cookie" or "I want a cookie."

The infant's spoken vocabulary rapidly increases once the first word is spoken (Pan & Uccelli, 2009). The average 18-month-old can speak about 50 words but by

What characterizes the infant's early word learning?

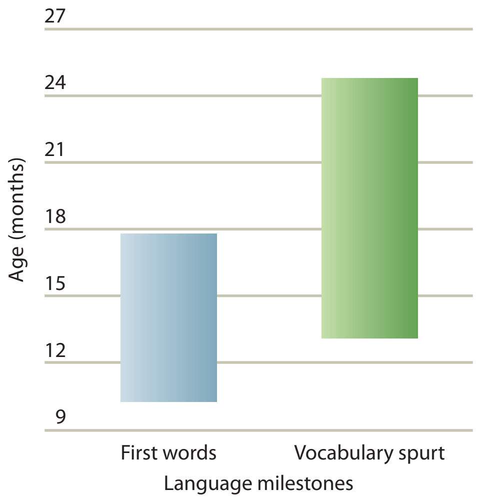

FIGURE **5.14**

VARIATION IN LANGUAGE MILESTONES. *What are some possible explanations for variations in the timing of these milestones?*

the age of 2 years can speak about 200 words. This rapid increase in vocabulary that begins at approximately 18 months is called the *vocabulary spurt* (Bloom, Lifter, & Broughton, 1985).

Like the timing of a child's first word, the timing of the vocabulary spurt varies (Lieven, 2008). Figure 5.14 shows the range for these two language milestones in 14 children. On average, these children said their first word at 13 months and had a vocabulary spurt at 19 months. However, the ages for the first word of individual children varied from 10 to 17 months and for their vocabulary spurt from 13 to 25 months.

Children sometimes overextend or underextend the meanings of the words they use (Woodward & Markman, 1998). *Overextension* is the tendency to apply a word to objects that are inappropriate for the word's meaning. For example, children at first may say "*dada*" not only for "father" but also for other men, strangers, or boys. With time, overextensions decrease and eventually disappear. *Underextension* is the tendency to apply a word too narrowly; it occurs when children fail to use a word to name a relevant event or object. For example, a child might use the word *boy* to describe a 5-year-old neighbor but not apply the word to a male infant or to a 9-year-old male.

Two-Word Utterances By the time children are 18 to 24 months of age, they usually utter two-word utterances. To convey meaning with just two words, the child relies heavily on gesture, tone, and context. The wealth of meaning children can communicate with a two-word utterance includes the following (Slobin, 1972):

- Identification: "See doggie."
- Location: "Book there."
- Repetition: "More milk."
- Negation: "Not wolf."
- Possession: "My candy."
- Attribution: "Big car."
- Agent-action: "Mama walk."
- Action-direct object: "Hit you."
- Action-indirect object: "Give Papa."
- Action-instrument: "Cut knife."
- Question: "Where ball?"

These are examples from children whose first language is English, German, Russian, Finnish, Turkish, or Samoan.

Notice that the two-word utterances omit many parts of speech and are remarkably succinct. In fact, in every language, a child's first combinations of words have this economical quality; they are telegraphic. **Telegraphic speech** is the use of short and precise words without grammatical markers such as articles, auxiliary verbs, and other connectives. Telegraphic speech is not limited to two words. "Mommy give ice cream" and "Mommy give Tommy ice cream" also are examples of telegraphic speech.

Around the world, most young children learn to speak in two-word utterances, at about 18 to 24 months of age. *What are some examples of these two-word utterances?*

BIOLOGICAL AND ENVIRONMENTAL INFLUENCES

We have discussed a number of language milestones in infancy; Figure 5.15 summarizes the approximate time at which infants typically reach these milestones. But what makes this amazing development possible? Everyone who uses language in some way "knows" its rules and has the ability to create an infinite number of words and sentences. Where does this knowledge come from? Is it the product of biology? Is language learned and influenced by experiences?

telegraphic speech The use of short and precise words without grammatical markers such as articles, auxiliary verbs, and other connectives.

Biological Influences The ability to speak and understand language requires a certain vocal apparatus as well as a nervous system with certain capabilities. The nervous system and vocal apparatus of humanity's predecessors changed over hundreds of thousands or millions of years. With advances in the nervous system and vocal structures, *Homo sapiens* went beyond the grunting and shrieking of other animals to develop speech. Although estimates vary, many experts believe that humans acquired language about 100,000 years ago, which in evolutionary time, represents a very recent acquisition. It gave humans an enormous edge over other animals and increased the chances of human survival.

Some language scholars view the remarkable similarities in how children acquire language all over the world as strong evidence that language has a biological basis. There is evidence that particular regions of the brain are predisposed to be used for language (Bortfeld, Fava, & Boas, 2009; Spocter & others, 2010). Two regions involved in language were first discovered in studies of brain-damaged individuals: **Broca's area,** an area in the left frontal lobe of the brain involved in producing words, and **Wernicke's area,** a region of the brain's left hemisphere involved in language comprehension (see Figure 5.16). Damage to either of these areas produces types of **aphasia,** which is a loss or impairment of language processing. Individuals with damage to Broca's area have difficulty producing words correctly; individuals with damage to Wernicke's area have poor comprehension and often produce fluent but incomprehensible speech.

Linguist Noam Chomsky (1957) proposed that humans are biologically prewired to learn language at a certain time and in a certain way. He said that children are born into the world with a **language acquisition device (LAD),** a biological endowment that enables the child to detect certain features and rules of language, including phonology, syntax, and semantics. Children are prepared by nature with the ability to detect the sounds of language, for example, and follow rules such as how to form plurals and ask questions.

Chomsky's LAD is a theoretical construct, not a physical part of the brain. Is there evidence for the existence of a LAD? Supporters of the LAD concept cite the uniformity of language milestones across languages and cultures, evidence that children create language even in the absence of well-formed input, and biological substrates of language. But, as we will see, critics argue that even if infants have something like a LAD, it cannot explain the whole story of language acquisition.

Environmental Influences Decades ago, behaviorists opposed Chomsky's hypothesis and argued that language represents nothing more than chains of responses acquired through reinforcement (Skinner, 1957). A baby happens to babble "Ma-ma"; Mama rewards the baby with hugs and smiles; the baby says "Mama" more and more. Bit by bit, said the behaviorists, the baby's language is built up.

In the wild, chimps communicate through calls, gestures, and expressions, which evolutionary psychologists believe might be the roots of true language. *How strong is biology's role in language?*

Typical Age	Language Milestones
Birth	Crying
2 to 4 months	Cooing begins
5 months	Understands first word
6 months	Babbling begins
7 to 11 months	Change from universal linguist to language-specific listener
8 to 12 months	Uses gestures, such as showing and pointing Comprehension of words appears
13 months	First word spoken
18 months	Vocabulary spurt starts
18 to 24 months	Uses two-word utterances Rapid expansion of understanding of words

FIGURE **5.15**

SOME LANGUAGE MILESTONES IN INFANCY. Despite great variations in the language input received by infants, around the world they follow a similar path in learning to speak.

developmental **connection**

Language. Much of language is processed in the brain's left hemisphere. Chapter 4, p. 114

Broca's area An area in the brain's left frontal lobe that is involved in speech production.

Wernicke's area An area in the brain's left hemisphere that is involved in language comprehension.

aphasia A loss or impairment of language ability caused by brain damage.

language acquisition device (LAD) Chomsky's term that describes a biological endowment enabling the child to detect the features and rules of language, including phonology, syntax, and semantics

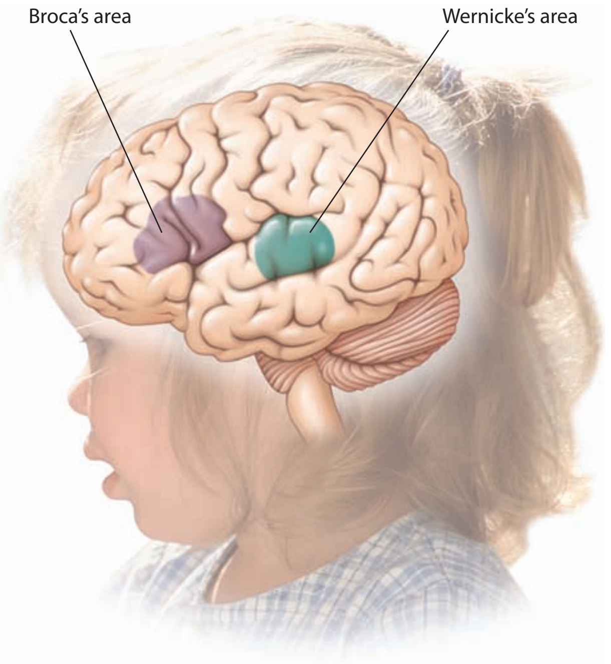

FIGURE **5.16**

BROCA'S AREA AND WERNICKE'S AREA. Broca's area is located in the frontal lobe of the brain's left hemisphere, and it is involved in the control of speech. Wernicke's area is a portion of the left hemisphere's temporal lobe that is involved in understanding language. *How does the role of these areas of the brain relate to lateralization, which was discussed in Chapter 4?*

FIGURE **5.17**

SOCIAL INTERACTION AND BABBLING. One study focused on two groups of mothers and their 8-month-old infants (Goldstein, King, & West, 2003). One group of mothers was instructed to smile and touch their infants immediately after the babies cooed and babbled; the other group was also told to smile and touch their infants but in a random manner, unconnected to sounds the infants made. The infants whose mothers immediately responded in positive ways to their babbling subsequently made more complex, speechlike sounds, such as "da" and "gu." The importance of caregivers in the early development of language, is shown here.

According to behaviorists, language is a complex learned skill, much like playing the piano or dancing.

The behaviorist view of language learning has several problems. First, it does not explain how people create novel sentences—sentences that people have never heard or spoken before. Second, children learn the syntax of their native language even if they are not reinforced for doing so. Social psychologist Roger Brown (1973) spent long hours observing parents and their young children. He found that parents did not directly or explicitly reward or correct the syntax of most children's utterances. That is, parents did not say "good," "correct," "right," "wrong," and so on. Also, parents did not offer direct corrections such as, "You should say two shoes, not two shoe." However, as we will see shortly, many parents do expand on their young children's grammatically incorrect utterances and recast many of those that have grammatical errors (Clark, 2009).

The behavioral view is no longer considered a viable explanation of how children acquire language. But a great deal of research describes ways in which children's environmental experiences influence their language skills (Berko Gleason & Ratner, 2009). Many language experts argue that a child's experiences, the particular language to be learned, and the context in which learning takes place can strongly influence language acquisition (Goldfield & Snow, 2009).

Language is not learned in a social vacuum. Most children are bathed in language from a very early age (Sachs, 2009), unlike the Wild Boy of Aveyron, who never learned to communicate effectively, having lived in social isolation for years. The support and involvement of caregivers and teachers greatly facilitate a child's language learning (Snow & Yang, 2006). For example, one study found that when mothers immediately smiled and touched their 8-month-old infants after they babbled, the infants subsequently made more complex speechlike sounds than when mothers responded to their infants in a random manner (Goldstein, King, & West, 2003) (see Figure 5.17).

Michael Tomasello (2003, 2006, 2008) stresses that young children are intensely interested in their social world and that early in their development they can understand the intentions of other people. His *interaction view* of language emphasizes that children learn language in specific contexts. For example, when a toddler and a father are jointly focused on a book, the father might say, "See the birdie." In this case, even a toddler understands that the father intends to name something and knows to look in the direction of the pointing. Through this kind of joint attention, early in their development children are able to use their social skills to acquire language (Meltzoff & Brooks, 2009; Tomasello, 2008). One recent study revealed that joint attention at 12 and 18 months predicted language skills at 24 months of age (Mundy & others, 2007).

Researchers have also found that the child's vocabulary development is linked to the family's socioeconomic status and the type of talk that parents direct to their children. Betty Hart and Todd Risley (1995) observed the language environments of children whose parents were professionals and children whose parents were on welfare. Compared with the professional parents, the parents on welfare talked much less to their young children, talked less about past events, and provided less elaboration. As indicated in Figure 5.18, the children of the professional parents had a much larger vocabulary at 36 months of age than the children of the welfare parents.

Other research has linked how much mothers speak to their infants and the infants' vocabularies. For example, in one study by Janellen Huttenlocher and her colleagues (1991) infants whose mothers spoke more often to them had markedly higher vocabularies. By the second birthday, vocabulary differences were substantial.

However, a study of 1- to 3-year-old children living in low-income families found that the sheer amount of maternal talk was not the best predictor of a child's vocabulary growth (Pan & others, 2005). Rather, it was maternal language and literacy skills, and mothers' diversity of vocabulary use that best predicted children's vocabulary development. For example, when mothers used a more diverse vocabulary when talking with their children, their children's vocabulary benefited, but their children's vocabulary was not related to the total amount of their talkativeness with their children. Also, mothers who frequently used pointing gestures had children with a greater vocabulary. Pointing usually occurs in concert with speech, and it may enhance the meaning of mothers' verbal input to their children.

These research studies and others (NICHD Early Child Care Research Network, 2005) demonstrate the important effect that early speech input and poverty can have on the development of a child's language skills. One intriguing component of the young child's linguistic environment is **child-directed speech,** language spoken in a higher pitch than normal with simple words and sentences (Clark, 2009; Zangl & Mills, 2007). It is hard to use child-directed speech when not in the presence of a baby, but parents shift into it when they start talking to a baby. Much of this is automatic and something most parents are not aware they are doing. Even 4-year-olds speak in simpler ways to 2-year-olds than to their 4-year-old friends. Child-directed speech has the important function of capturing the infant's attention and maintaining communication (Jaswal & Fernald, 2007). Adults often use strategies other than child-directed speech to enhance the child's acquisition of language, including recasting, expanding, and labeling: *Recasting* is rephrasing something the child has said, perhaps turning it into a question or restating the child's immature utterance in the form of a fully grammatical sentence. For example, if the child says, "The dog was barking," the adult can respond by asking, "When was the dog barking?" Effective recasting lets the child indicate an interest and then elaborates on that interest.

- *Expanding* is restating, in a linguistically sophisticated form, what a child has said. For example, a child says, "Doggie eat," and the parent replies, "Yes, the doggie is eating."
- *Labeling* is identifying the names of objects. Young children are forever being asked to identify the names of objects. Roger Brown (1958) called this "the original word game" and claimed that much of a child's early vocabulary is motivated by this adult pressure to identify the words associated with objects.

Parents use these strategies naturally and in meaningful conversations. Parents do not need to use a particular method to teach their children to talk, even for children who are slow in learning language. Children usually benefit when parents follow the child's lead, talking about things the child is interested in at the moment, and when parents provide information that children can process. If children are not ready to take in some information, they are likely to tell you (perhaps by turning away). Thus, giving the child more information is not always better.

Remember, the encouragement of language development, not drill and practice, is the key. Language development is not a simple matter of imitation and reinforcement.

Infants, toddlers, and young children benefit when adults read books to and with them (shared reading) (DeLoache & Ganea, 2009; Rodriguez, Hines, & Montiel, 2008; Westerlund & Lagerberg, 2008). Storybook reading especially benefits children when parents extend the meaning of the text by discussing it with children and encouraging them to ask and answer questions (Barbarin & Aikens, 2009; Whitehurst & Lonigan, 1998). In one study, a majority of U.S. mothers in low-income families reported that they were reading to their infants and toddlers with some regularity (Raikes & others, 2006). In this study, non-Latino White, more highly

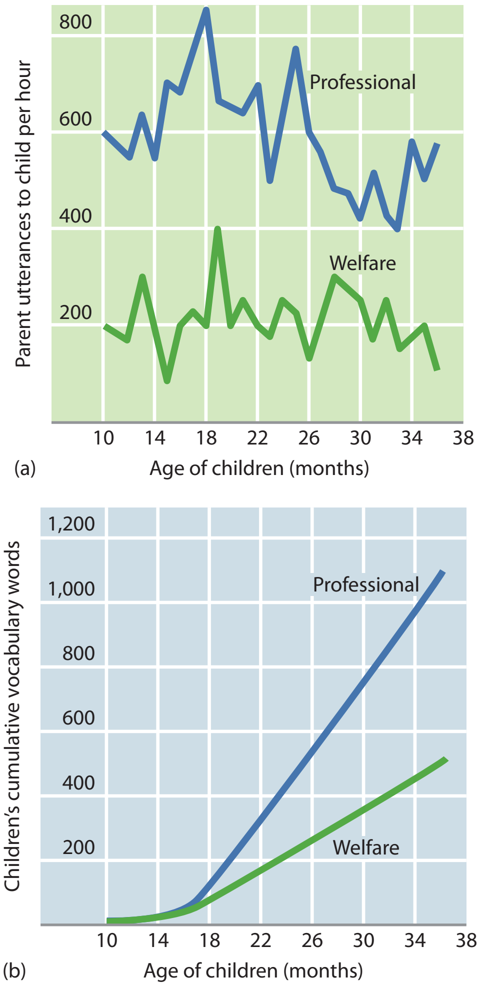

FIGURE **5.18**

LANGUAGE INPUT IN PROFESSIONAL AND WELFARE FAMILIES AND YOUNG CHILDREN'S VOCABULARY DEVELOPMENT. (*a*) In this study (Hart & Reísley, 1995), parents from professional families talked with their young children more than parents from welfare families. (*b*) All of the children learned to talk, but children from professional families developed vocabularies that were twice as large as those from welfare families. Thus, by the time children go to preschool, they already have experienced considerable differences in language input in their families and developed different levels of vocabulary that are linked to their socioeconomic context. *Does this study indicate that poverty caused deficiencies in vocabulary development?*

child-directed speech Language spoken in a higher pitch than normal with simple words and sentences.

What characterizes shared reading in the lives of infants, toddlers, and young children?

educated mothers who were parenting a first-born child were more likely to read books to their infants and toddlers than were African American and Latino mothers who were parenting later-born children. Reading daily to children at 14 to 24 months of age was positively related to the children's language and cognitive development at 36 months of age. To read further about ways that parents can facilitate children's language development, see *Connecting Development to Life*.

AN INTERACTIONIST VIEW

If language acquisition depended only on biology, then the Wild Boy of Aveyron and Genie (discussed earlier in the chapter) should have talked without difficulty. A child's experiences influence language acquisition. But we have seen that language does have strong biological foundations. No matter how much you converse with a dog, it won't learn to talk. In contrast, children are biologically prepared to learn language. Children all over the world acquire language milestones at about the same time and in about the same order.

Environmental influences are also very important in development competence in language (Berko Gleason, 2009; Goldfield & Snow, 2009). Children whose parents

connecting development to life

How Parents Can Facilitate Infants' and Toddlers' Language Development

In *Growing Up With Language,* linguist Naomi Baron (1992) provided ideas to help parents facilitate their child's language development. A summary of her ideas follows:

Infants

- *Be an active conversational partner.* Initiate conversation with the infant. If the infant is in a daylong child-care program, ensure that the baby receives adequate language stimulation from adults.
- *Talk as if the infant understands what you are saying.* Parents can generate self-fulfilling prophecies by addressing their young children as if they understand what is being said. The process may take four to five years, but children gradually rise to match the language model presented to them.
- *Use a language style with which you feel comfortable.* Don't worry about how you sound to other adults when you talk with your child. Your affect, not your content, is more important when talking with an infant. Use whatever type of baby talk with which you feel comfortable.

Toddlers

- *Continue to be an active conversational partner.* Engaging toddlers in conversation, even one-sided conversation, is the most important thing a parent can do to nourish a child linguistically.
- *Remember to listen.* Since toddlers' speech is often slow and laborious, parents are often tempted to supply words and thoughts for them. Be patient and let toddlers express themselves, no matter how painstaking the process is or how great a hurry you are in.

It is a good idea for parents to begin talking to their babies at the start. The best language teaching occurs when the talking is begun before the infant becomes capable of intelligible speech. *What are some other guidelines for parents to follow in helping their infants and toddlers develop their language?*

connecting development to life

(continued)

- *Use a language style with which you are comfortable, but consider ways of expanding your child's language abilities and horizons.* For example, using long sentences need not be problematic. Use rhymes. Ask questions that encourage answers other than "Yes" and "No." Actively repeat, expand, and recast the child's utterances. Introduce new topics. And use humor in your conversation.
- *Adjust to your child's idiosyncrasies instead of working against them.* Many toddlers have difficulty pronouncing words and making themselves understood. Whenever possible, make toddlers feel that they are being understood.
- *Avoid sexual stereotypes.* Don't let the toddler's sex determine your amount or style of conversation. Many American mothers are more linguistically supportive of girls than of boys, and many fathers talk less with their children than mothers do. Cognitively enriching initiatives from both mothers and fathers benefit both boys and girls.
- *Resist making normative comparisons.* Be aware of the ages at which your child reaches specific milestones (such as the first word, first 50 words), but do not measure this development rigidly against that of other children. Such social comparisons can bring about unnecessary anxiety.

The first suggestion Baron makes to parents of infants is to "be an active conversational partner." What did you learn earlier in the chapter about the amount of conversation mothers have with their infants? Does the amount of conversation or the mother's literacy skills and vocabulary diversity have more of a positive effect on infants' vocabulary?

provide them with a rich verbal environment show many positive benefits. Parents who pay attention to what their children are trying to say, expand their children's utterances, read to them, and label things in the environment, are providing valuable benefits for them (Berko Gleason, 2009).

An interactionist view emphasizes that both biology and experience contribute to language development. How much of the language is biologically determined, and how much depends on interaction with others is a subject of debate among linguists and psychologists. However, all agree that both biological capacity and relevant experience are necessary (Berko Gleason, 2009; Tomasello, 2008).

Review *Connect* Reflect

LG4 Describe the nature of language and how it develops in infancy.

Review

- What is language?
- What are language's rule systems?
- How does language develop in infancy?
- What are some biological and environmental influences on language?
- To what extent do biological and environmental influences interact to produce language development?

Connect

- In Chapter 1, you learned that the more years children spend living in poverty, the more their physiological indices of stress are elevated. In this chapter, you learned about the effects of SES on children's language acquisition and vocabulary building. How might these effects influence children's school performance?

Reflect *Your Own Personal Journey of Life*

- Would it be a good idea for you as a parent to hold large flash cards of words in front of your baby for several hours each day to help the baby learn language and improve the baby's intelligence? Why or why not? What do you think Piaget would say about this activity?

topical **connections**

Advances in infants' cognitive development are linked to their socioemotional development. In Chapter 6 you will learn about the infant's developing social orientation and understanding, which involve perceiving people as engaging in intentional and goal-directed behavior, joint attention, and cooperation. In Chapter 7, you will read about two major theorists—Piaget and Vygotsky—and how they propose that young children's thinking advances. You will see how young children become more capable of sustaining their attention; learn about the astonishing rate at which preschool children's vocabulary expands; and explore variations in early childhood education.

*looking **forward***

reach your **learning goals**

1 Piaget's Theory of Infant Development

LG1 Summarize and evaluate Piaget's theory of infant development.

Cognitive Processes

- In Piaget's theory, children actively construct their own cognitive worlds, building mental structures to adapt to their world. Schemes are actions or mental representations that organize knowledge. Behavioral schemes (physical activities) characterize infancy, whereas mental schemes (cognitive activities) develop in childhood. Assimilation occurs when children use their existing schemes to deal with new information; accommodation refers to children's adjustment of their schemes in the face of new information. Through organization, children group isolated behaviors into a higher-order, more smoothly functioning cognitive system. Equilibration is a mechanism Piaget proposed to explain how children shift from one cognitive stage to the next. As children experience cognitive conflict in trying to understand the world, they use assimilation and accommodation to obtain equilibrium. The result is a new stage of thought. According to Piaget, there are four qualitatively different stages of thought.

The Sensorimotor Stage

- In sensorimotor thought, the first of Piaget's four stages, the infant organizes and coordinates sensations with physical movements. The stage lasts from birth to about 2 years of age. Sensorimotor thought has six substages: simple reflexes; first habits and primary circular reactions; secondary circular reactions; coordination of secondary circular reactions; tertiary circular reactions, novelty, and curiosity; and internalization of schemes. One key accomplishment of this stage is object permanence, the ability to understand that objects continue to exist even though the infant is no longer observing them. Another aspect involves infants' understanding of cause and effect.

Evaluating Piaget's Sensorimotor Stage

- Piaget opened up a whole new way of looking at infant development in terms of coordinating sensory input with motoric actions. In the past decades, revisions of Piaget's view have been proposed based on research. For example, researchers have found that a stable and differentiated perceptual world is established earlier than Piaget envisioned, and infants begin to develop concepts as well. The nature-nurture issue in regard to infant cognitive development continues to be debated. Spelke endorses a core knowledge approach, which states that infants are born with domain-specific innate knowledge systems. Critics argue that Spelke has not given adequate attention to early experiences that infants have.

2 Learning, Remembering, and Conceptualizing

LG2 Describe how infants learn, remember, and conceptualize.

Conditioning

- Operant conditioning techniques have especially been useful to researchers in demonstrating infants' perception and retention of information about perceptual-motor actions.

Attention

- Attention is the focusing of mental resources on select information, and in infancy attention is closely linked with habituation. In the first year, much of attention is of the orienting/investigative type, but sustained attention also becomes important. Habituation is the repeated presentation of the same stimulus, causing reduced attention to the stimulus. If a different stimulus is presented, and the infant pays increased attention to it, dishabituation is occurring. Joint attention plays an important role in infant development, especially in the infant's acquisition of language.

Memory

- Memory is the retention of information over time. Infants as young as 2 to 6 months of age can retain information about perceptual-motor actions. However, many experts argue that what we commonly think of as memory (consciously remembering the past) does not occur until the second half of the first year of life. By the end of the second year, long-term memory is more substantial and reliable. The hippocampus and frontal lobes of the brain are involved in development of explicit memory in infancy. The phenomenon of not being able to remember events that occurred before the age of 3—known as infantile or childhood amnesia—may be due to the immaturity of the prefrontal lobes of the brain at that age.

Imitation

- Meltzoff has shown that newborns can match their behaviors (such as protruding their tongue) to a model. His research also shows that deferred imitation occurs as early as 9 months of age.

Concept Formation and Categorization

- Mandler argues that it is not until about 7 to 9 months of age that infants form conceptual categories, although we do not know precisely when concept formation begins. Infants' first concepts are broad. Over the first two years of life, these broad concepts gradually become more differentiated.

3 Individual Differences and Assessment

LG3 Discuss infant assessment measures and the prediction of intelligence.

Measures of Infant Development

- Gesell's scale is still widely used by pediatricians to distinguish normal and abnormal infants; it provides a developmental quotient (DQ). The Bayley Scales of Infant Development, developed by Nancy Bayley, continue to be widely used today to assess infant development. The current version, the Bayley-III, consists of five scales: cognitive, language, motor, socioemotional, and adaptive. Increasingly used, the Fagan Test of Infant Intelligence assesses how effectively the infant processes information.

Predicting Intelligence

- Developmental scales for infants grew out of the tradition of IQ testing of older children. These scales are less verbal than IQ tests. Global scores on the Gesell and Bayley scales are not good predictors of IQ scores in later childhood. However, measures of information processing such as speed of habituation and degree of dishabituation do correlate with intelligence later in childhood. There are both continuity and discontinuity between infant cognitive development and cognitive development later in childhood.

4 Language Development

LG4 Describe the nature of language and how it develops in infancy.

Defining Language

- Language is a form of communication, whether spontaneous, written, or signed, that is based on a system of symbols. Language consists of the words used by a community and the rules for varying and combining them. Language is characterized by infinite generativity.

Language's Rule Systems

- Phonology is the sound system of the language, including the sounds that are used and how they may be combined. Morphology refers to the units of meaning involved in word formation. Syntax is the way words are combined to form acceptable phrases and sentences. Semantics involves the meaning of words and sentences. Pragmatics is the appropriate use of language in different contexts.

How Language Develops

- Among the milestones in infant language development are crying (birth), cooing (1 to 2 months), babbling (6 months), making the transition from universal linguist to language-specific listener (6 to 12 months), using gestures (8 to 12 months), comprehension of words (8 to 12 months), first word spoken (13 months), vocabulary spurt (19 months), rapid expansion of understanding words (18 to 24 months), and two-word utterances (18 to 24 months).

Biological and Environmental Influences

- In evolution, language clearly gave humans an enormous advantage over other animals and increased their chance of survival. Broca's area and Wernicke's area are important locations for language processing in the brain's left hemisphere. Chomsky argues that children are born with the ability to detect basic features and rules of language. In other words, they are biologically prepared to learn language with a prewired language acquisition device (LAD). The behavioral view—that children acquire language as a result of reinforcement—has not been supported. Adults help children acquire language through child-directed speech, recasting, expanding, and labeling. Environmental influences are demonstrated by differences in the language development of children as a consequence of being exposed to different language environments in the home. Parents should talk extensively with an infant, especially about what the baby is attending to.

An Interactionist View

- Today, most language researchers believe that children everywhere arrive in the world with special social and linguistic capacities that make language acquisition not just likely, but inevitable for virtually all children. How much of the language is biologically determined, and how much depends on interaction with others, is a subject of debate among linguists and psychologists. However, all agree that both biological capacity and relevant experience are necessary.

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chapter 6

SOCIOEMOTIONAL DEVELOPMENT IN INFANCY

chapter **outline**

1 Emotional and Personality Development

Learning Goal 1 Discuss the development of emotions and personality in infancy.

Emotional Development
Temperament
Personality Development

2 Social Orientation/Understanding and Attachment

Learning Goal 2 Describe social orientation/understanding and the development of attachment in infancy.

Social Orientation/Understanding
Attachment and Its Development
Individual Differences in Attachment
Caregiving Styles and Attachment

3 Social Contexts

Learning Goal 3 Explain how social contexts influence the infant's development.

The Family
Child Care

An increasing number of fathers are staying home to care for their children (Lamb, 2010; O'Brien & Moss, 2010). Consider 17-month-old Darius. On weekdays, Darius' father, a writer, cares for him during the day while his mother works full-time as a landscape architect. Darius' father is doing a great job of caring for him. He keeps Darius nearby while he is writing and spends lots of time talking to him and playing with him. From their interactions, it is clear that they genuinely enjoy each other.

Last month, Darius began spending one day a week at a child-care center. His parents carefully selected the center after observing a number of centers and interviewing teachers and center directors. His parents placed him in the center one day a week because they wanted Darius to get some experience with peers and to give his father some time out from his caregiving.

Darius' father looks to the future and imagines the Little League games Darius will play in and the many other activities he can enjoy with Darius. Remembering how little time his own father spent with him, he is dedicated to making sure that Darius has an involved, nurturing experience with his father.

When Darius' mother comes home in the evenings, she spends considerable time with him. Darius has a secure attachment with both his mother and his father.

Many fathers are spending more time with their infants today than in the past.

topical **connections**

Until now, we have only discussed the social situations and emotions of parents before and after the arrival of their infants, focusing on such topics as parents' feelings of joy, anticipation, anxiety, and stress during pregnancy; how a mother's optimism may lead to less adverse outcomes for her fetus; and parents' emotional and psychological adjustments in the postpartum period. In this chapter, we will explore the infant's socioemotional development.

looking ***back***

preview

In Chapters 4 and 5, you read about how the infant perceives, learns, and remembers. Infants also are socioemotional beings, capable of displaying emotions and initiating social interaction with people close to them. The main topics that we will explore in this chapter are emotional and personality development, social understanding and attachment, and the social contexts of the family and child care.

1 Emotional and Personality Development

LG1 Discuss the development of emotions and personality in infancy.

- Emotional Development
- Temperament
- Personality Development

Anyone who has been around infants for even a brief time detects that they are emotional beings. Not only do infants express emotions, but they also vary in their temperament. Some are shy and others are outgoing. Some are active and others much less so. In this section, we will explore these and other aspects of emotional and personality development in infants.

EMOTIONAL DEVELOPMENT

Blossoms are scattered by
the wind
And the wind cares nothing, but
The blossoms of the heart
No wind can touch.

—Yoshida Kenko
Buddhist Monk, 14th Century

Imagine your life without emotion. Emotion is the color and music of life, as well as the tie that binds people together. How do psychologists define and classify emotions, and why are they important to development? How do emotions develop during the first two years of life?

What Are Emotions? For our purposes, we will define **emotion** as feeling, or affect, that occurs when a person is in a state or an interaction that is important to him or her, especially to his or her well-being. In many instances emotions involve an individual's communication with the world. Although emotion consists of more than communication, in infancy it is the communication aspect that is at the forefront of emotion (Campos, 2009).

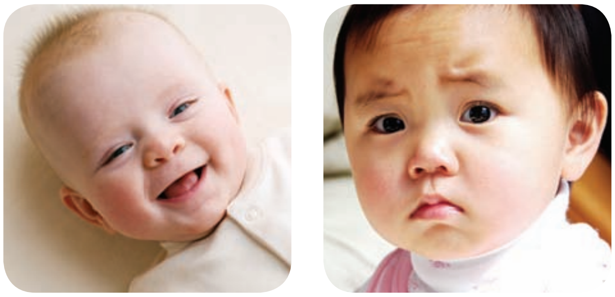
Psychologists classify the broad range of emotions in many ways, but almost all classifications designate an emotion as either positive or negative (Izard, 2009). Positive emotions include enthusiasm, joy, and love. Negative emotions include anxiety, anger, guilt, and sadness.

Biological and Environmental Influences Emotions are influenced both by biological foundations and by a person's experience. Biology's importance to emotion is apparent in the changes in a baby's emotional capacities (Kagan, 2010). Certain regions of the brain that develop early in life (such as the brain stem, hippocampus, and amygdala) play a role in distress, excitement, and rage, and even infants display these emotions (Buss & Goldsmith, 2007). But, as we discuss later in the chapter, infants only gradually develop the ability to regulate their emotions, and this ability seems tied to the gradual maturation of the frontal regions of the cerebral cortex (discussed in Chapter 4) that can exert control over other areas of the brain (Bell, Greene, & Wolfe, 2010).

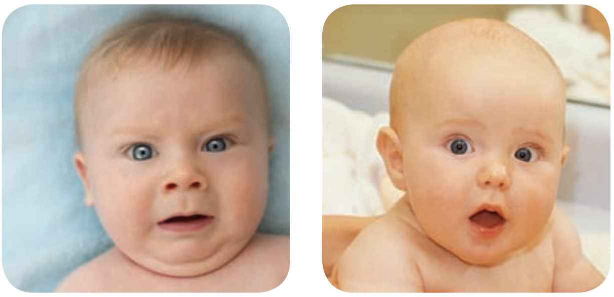
These biological factors, however, are only part of the story of emotion. Emotions serve important functions in our relationships (Stern, 2010; Thompson, 2010). As we discuss later in this section, emotions are the first language with which parents and infants communicate. Emotion-linked interchanges, as when Darius cries and his father sensitively responds, provide the foundation for the infant's developing attachment to the parent.

How do Japanese mothers handle their infants' and children's emotional development differently than non-Latina white mothers?

emotion Feeling, or affect, that occurs when a person is in a state or interaction that is important to him or her. Emotion is characterized by behavior that reflects (expresses) the pleasantness or unpleasantness of the state a person is in or the transactions being experienced.



Joy Sadness



Fear Surprise

FIGURE **6.1**

EXPRESSION OF DIFFERENT EMOTIONS IN INFANTS

Social relationships, in turn, provide the setting for the development of a rich variety of emotions (Kopp, 2011; Thompson, 2010). When toddlers hear their parents quarreling, they often react with distress and inhibit their play. Well-functioning families make each other laugh and may develop a light mood to defuse conflicts. Biological evolution has endowed human beings to be *emotional*, but embeddedness in relationships and culture with others provides diversity in emotional experiences (Thompson & Virmani, 2010). For example, researchers have found that East Asian infants display less frequent and less positive and negative emotions than non-Latino White infants (Cole & Tan, 2007). Further, Japanese parents try to prevent their children from experiencing negative emotions, whereas non-Latino White mothers are more likely to respond after their children become distressed and then help them cope (Cole & Tan, 2007).

Early Emotions Leading expert on infant emotional development, Michael Lewis (2007, 2008) distinguishes between primary emotions and self-conscious emotions. **Primary emotions** are emotions that are present in humans and other animals; these emotions appear in the first 6 months of the human infant's development. Primary emotions include surprise, interest, joy, anger, sadness, fear, and disgust (see Figure 6.1 for infants' facial expressions of some of these early emotions). In Lewis' classification, **self-conscious emotions** require self-awareness that involves consciousness and a sense of "me." Self-conscious emotions include jealousy, empathy, embarrassment, pride, shame, and guilt, most of these occurring for the first time at some point in the second half of the first year through the second year. Some experts on emotion call self-conscious emotions such as embarrassment, shame, guilt, and pride *other-conscious emotions* because they involve the emotional reactions of others when they are generated (Saarni & others, 2006). For example, approval from parents is linked to toddlers beginning to show pride when they successfully complete a task.

FIGURE **6.2**

IS THIS THE EARLY EXPRESSION OF JEALOUSY? In the study by Hart and Carrington (2002), the researchers concluded that the 6-month-old infants who observed their mothers giving attention to a baby doll displayed negative emotions—such as anger and sadness—which may indicate the early appearance of jealousy. However, experts on emotional development, such as Joseph Campos (2009) and Jerome Kagan (2010) argue that it is unlikely emotions such as jealousy appear in the first year. *Why do they conclude that it is unlikely jealousy occurs in the first year?*

Researchers such as Joseph Campos (2005) and Michael Lewis (2007) debate how early in the infant and toddler years the emotions that we have described first appear and their sequence. As an indication of the controversy regarding when certain emotions first are displayed by infants, consider jealousy. Some researchers argue that jealousy does not emerge until approximately 18 months of age (Lewis, 2007), whereas others emphasize that it is displayed much earlier (Draghi-Lorenz, 2007; Draghi-Lorenz, Reddy, & Costall, 2001). Consider a research study in which 6-month-old infants observed their mothers either giving attention to a life-like baby doll (hugging or gently rocking it, for example) or to a book (Hart & Carrington, 2002). When mothers directed their attention to the doll, the infants were more likely to display negative emotions, such as anger and sadness, which may have indicated their jealousy (see Figure 6.2). On the other hand, their expressions of anger and sadness may have reflected frustration in not being able to have the novel doll to play with. Debate about the onset of an emotion such as jealousy illustrates the complexity and difficulty in indexing early emotions. That said, some experts on infant socioemotional development, such as Jerome Kagan (2010), conclude that the structural immaturity of the infant brain make it unlikely that emotions which require thought—such as guilt, pride, despair, shame, empathy, and jealousy—can be experienced in the first year.

primary emotions Emotions that are present in humans and other animals and emerge early in life; examples are joy, anger, sadness, fear, and disgust.

self-conscious emotions Emotions that require self-awareness, especially consciousness and a sense of "me"; examples include jealousy, empathy, and embarrassment.

Emotional Expression and Social Relationships Emotional expressions are involved in infants' first relationships. The ability of infants to communicate emotions permits coordinated interactions with their caregivers and the beginning of an emotional bond between them (Thompson, 2010). Not only do parents change their emotional expressions in response to infants' emotional expressions, but infants also modify their emotional expressions in response to their parents' emotional expressions (Bridgett & others, 2009). In other words, these interactions are mutually regulated. Because of this coordination, the interactions are described as *reciprocal,* or *synchronous,* when all is going well. Sensitive, responsive parents help their infants grow emotionally, whether the infants respond in distressed or happy ways (Thompson & Newton, 2009).

Cries and smiles are two emotional expressions that infants display when interacting with parents. These are babies' first forms of emotional communication.

Crying Crying is the most important mechanism newborns have for communicating with their world. The first cry verifies that the baby's lungs have filled with air. Cries also may provide information about the health of the newborn's central nervous system. Newborns even tend to respond with cries and negative facial expressions when they hear other newborns cry (Dondi, Simion, & Caltran, 1999).

Babies have at least three types of cries:

- **Basic cry.** A rhythmic pattern that usually consists of a cry, followed by a briefer silence, then a shorter whistle that is somewhat higher in pitch than the main cry, then another brief rest before the next cry. Some infancy experts believe that hunger is one of the conditions that incites the basic cry.
- **Anger cry.** A variation of the basic cry in which more excess air is forced through the vocal cords.
- **Pain cry.** A sudden long, initial loud cry followed by breath holding; no preliminary moaning is present. The pain cry is stimulated by a high-intensity stimulus.

Most adults can determine whether an infant's cries signify anger or pain (Zeskind, Klein, & Marshall, 1992). Parents can distinguish the cries of their own baby better than those of another baby.

Smiling Smiling is critical as a means of developing a new social skill and is a key social signal (Campos, 2009). The power of the infant's smiles was appropriately captured by British theorist John Bowlby (1969): "Can we doubt that the more and better an infant smiles the better he is loved and cared for? It is fortunate for their survival that babies are so designed by nature that they beguile and enslave mothers." Two types of smiling can be distinguished in infants:

- **Reflexive smile.** A smile that does not occur in response to external stimuli and appears during the first month after birth, usually during sleep.
- **Social smile.** A smile that occurs in response to an external stimulus, typically a face in the case of the young infant. Social smiling occurs as early as 2 months of age.

Daniel Messinger (2008) recently described the developmental course of infant smiling. From 2 to 6 months after birth, infants' social smiling increases considerably, both in self-initiated smiles and smiles in response to others' smiles. At 6 to 12 months, smiles that couple with what is called the Duchenne marker (eye constriction) and mouth opening occur in the midst of highly enjoyable interactions and play with parents (see Figure 6.3). In the second year, smiling continues to occur in such positive circumstances with parents, and in many cases an increase in smiling occurs when interacting with peers. Also in the second year, toddlers become increasingly aware of the social meaning of smiles, especially in their relationship with parents.

FIGURE **6.3**

A 6-MONTH-OLD'S STRONG SMILE. This strong smile reflects the Duchenne marker (eye constriction) and mouth opening.

He who binds himself to joy
Does the winged life destroy;
But he who kisses the joy as it flies;
Lives in eternity's sun rise.

—William Blake
English Poet, 19th Century

basic cry A rhythmic pattern usually consisting of a cry, a briefer silence, a shorter inspiratory whistle that is higher pitched than the main cry, and then a brief rest before the next cry.

anger cry A variation of the basic cry, with more excess air forced through the vocal cords.

pain cry A sudden appearance of a long, initial loud cry without preliminary moaning, followed by breath holding.

reflexive smile A smile that does not occur in response to external stimuli. It happens during the month after birth, usually during sleep.

social smile A smile in response to an external stimulus, which early in development is typically a face.

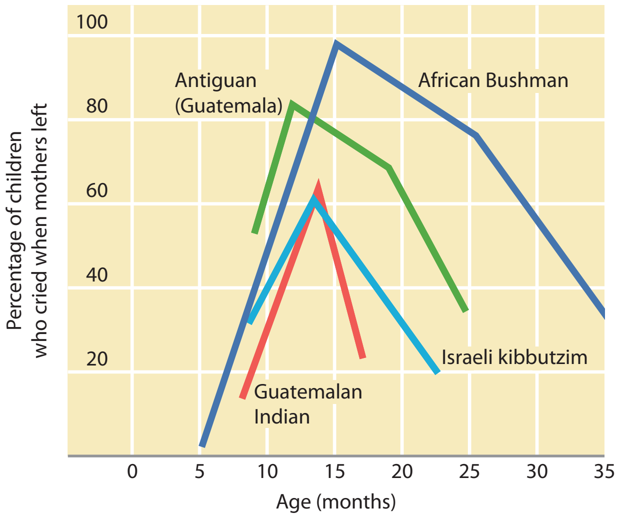


FIGURE **6.4**

SEPARATION PROTEST IN FOUR CULTURES. Note that separation protest peaked at about the same time in all four cultures in this study (13 to 15 months of age) (Kagan, Kearsley, & Zelazo, 1978). However, a higher percentage (100 percent) of infants in an African Bushman culture engaged in separation protest compared to only about 60 percent of infants in Guatemalan Indian and Israeli kibbutzim cultures. *What might explain the fact that separation protest peaks at about the same time in these cultures?*

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Infants also engage in *anticipatory smiling*, in which they communicate pre-existing positive emotion by smiling at an object and then turning their smile toward an adult. A recent study revealed that anticipatory smiling at 9 months of age was linked to parents' rating of the child's social competence at 2½ years of age (Parlade & others, 2009).

Fear One of a baby's earliest emotions is fear, which typically first appears at about 6 months of age and peaks at about 18 months. However, abused and neglected infants can show fear as early as 3 months (Campos, 2005). Researchers have found that infant fear is linked to guilt, empathy, and low aggression at 6 to 7 years of age (Rothbart, 2007).

The most frequent expression of an infant's fear involves **stranger anxiety,** in which an infant shows a fear and wariness of strangers. Stranger anxiety usually emerges gradually. It first appears at about 6 months of age in the form of wary reactions. By age 9 months, the fear of strangers is often more intense, reaching a peak toward the end of the first year of life, then decreasing thereafter (Scher & Harel, 2008).

Not all infants show distress when they encounter a stranger. Besides individual variations, whether an infant shows stranger anxiety also depends on the social context and the characteristics of the stranger.

Infants show less stranger anxiety when they are in familiar settings. For example, in one study 10-month-olds showed little stranger anxiety when they met a stranger in their own home but much greater fear when they encountered a stranger in a research laboratory (Sroufe, Waters, & Matas, 1974). Thus, it appears that, when infants feel secure, they are less likely to show stranger anxiety.

Who the stranger is and how the stranger behaves also influence stranger anxiety in infants. Infants are less fearful of child strangers than adult strangers. They also are less fearful of friendly, outgoing, smiling strangers than of passive, unsmiling strangers (Bretherton, Stolberg, & Kreye, 1981).

In addition to stranger anxiety, infants experience fear of being separated from their caregivers. The result is **separation protest**—crying when the caregiver leaves. Separation protest is initially displayed by infants at approximately 7 to 8 months and peaks at about 15 months among U.S. infants (Kagan, 2008). In fact, one study found that separation protest peaked at about 13 to 15 months in four different cultures (Kagan, Kearsley, & Zelazo, 1978). As indicated in Figure 6.4, the percentage of infants who engaged in separation protest varied across cultures, but the infants reached a peak of protest at about the same age—just before the middle of the second year of life.

Emotional Regulation and Coping

During the first year of life, the infant gradually develops an ability to inhibit, or minimize, the intensity and duration of emotional reactions (Kopp, 2008). From early in infancy, babies put their thumbs in their mouths to soothe themselves. But at first, infants mainly depend on caregivers to help them soothe their emotions, as when a caregiver rocks an infant to sleep, sings lullabyes to the infant, gently strokes the infant, and so on.

The caregivers' actions influence the infant's neurobiological regulation of emotions (Thompson, Meyers, & Jochem, 2008). By soothing the infant, caregivers help infants to modulate their emotion and reduce the level of stress hormones (de Haan & Gunnar, 2009). Many developmentalists stress that it is a good strategy for a caregiver to soothe an infant before the infant gets into an intense, agitated, uncontrolled state (McElwain & Booth-LaForce, 2006).

Later in infancy, when they become aroused, infants sometimes redirect their attention or distract themselves in order to reduce their arousal. By 2 years of age, toddlers can use language to define their feeling states and the context that is upsetting them (Kopp, 2008). A toddler might say, "Feel bad. Dog scare." This type of communication may help caregivers to help the child in regulating emotion.

stranger anxiety An infant's fear and wariness of strangers; it tends to appear in the second half of the first year of life.

separation protest An infant's distressed crying when the caregiver leaves.

Contexts can influence emotional regulation (Thompson, 2010; Thompson & Virmani, 2010). Infants are often affected by fatigue, hunger, time of day, which people are around them, and where they are. Infants must learn to adapt to different contexts that require emotional regulation. Further, new demands appear as the infant becomes older and parents modify their expectations. For example, a parent may take it in stride if a 6-month-old infant screams in a restaurant but may react very differently if a 1½-year-old starts screaming.

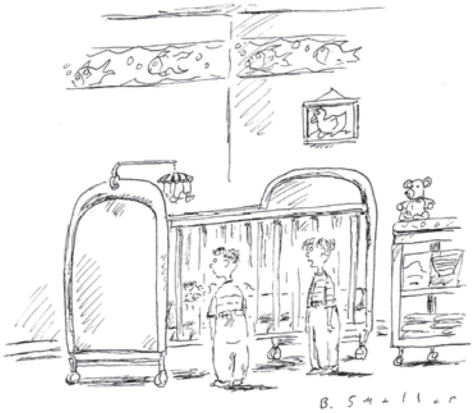
To soothe or not to soothe—should a crying baby be given attention and soothed, or does this spoil the infant? Many years ago, the behaviorist John Watson (1928) argued that parents spend too much time responding to infant crying. As a consequence, he said, parents reward crying and increase its incidence. More recently, behaviorist Jacob Gewirtz (1977) found that a caregiver's quick, soothing response to crying increased crying. In contrast, infancy experts Mary Ainsworth (1979) and John Bowlby (1989) stress that you can't respond too much to infant crying in the first year of life. They believe that a quick, comforting response to the infant's cries is an important ingredient in the development of a strong bond between the infant and caregiver. In one of Ainsworth's studies, infants whose mothers responded quickly when they cried at 3 months of age cried less later in the first year of life (Bell & Ainsworth, 1972).

Controversy still characterizes the question of whether or how parents should respond to an infant's cries (Lewis & Ramsay, 1999). However, developmentalists increasingly argue that an infant cannot be spoiled in the first year of life, which suggests that parents should soothe a crying infant. This reaction should help infants develop a sense of trust and secure attachment to the caregiver.

Should a crying baby be given attention and soothed, or does this spoil the infant? Should the infant's age, the type of cry, and the circumstances be considered?

TEMPERAMENT

Do you get upset a lot? Does it take much to get you angry, or to make you laugh? Even at birth, babies seem to have different emotional styles. One infant is cheerful and happy much of the time; another baby seems to cry constantly. These tendencies reflect **temperament,** which involves individual differences in behavioral styles, emotions, and characteristic ways of responding. With regard to its link to emotion, temperament refers to individual differences in how quickly the emotion is shown, how strong it is, how long it lasts, and how quickly it fades away (Campos, 2009).



"Oh, he's cute, all right, but he's got the temperament of a car alarm." Copyright © Barbara Smaller/The New Yorker Collection/www.cartoonbank.com

Describing and Classifying Temperament

How would you describe your temperament or the temperament of a friend? Researchers have described and classified the temperament of individuals in different ways. Here we will examine three of those ways.

Chess and Thomas' Classification Psychiatrists Alexander Chess and Stella Thomas (Chess & Thomas, 1977; Thomas & Chess, 1991) identified three basic types, or clusters, of temperament:

- An **easy child** is generally in a positive mood, quickly establishes regular routines in infancy, and adapts easily to new experiences.
- A **difficult child** reacts negatively and cries frequently, engages in irregular daily routines, and is slow to accept change.
- A **slow-to-warm-up child** has a low activity level, is somewhat negative, and displays a low intensity of mood.

In their longitudinal investigation, Chess and Thomas found that 40 percent of the children they studied could be classified as easy, 10 percent as difficult, and 15 percent as slow to warm up. Notice that 35 percent did not fit any of the three patterns. Researchers have found that these three basic clusters of temperament are moderately stable across the childhood years. A recent study revealed that young children with a difficult temperament showed more problems when they experienced

temperament Involves individual differences in behavioral styles, emotions, and characteristic ways of responding.

easy child A child who is generally in a positive mood, quickly establishes regular routines in infancy, and adapts easily to new experiences.

difficult child A child who tends to react negatively and cry frequently, engages in irregular daily routines, and is slow to accept change.

slow-to-warm-up child A child who has a low activity level, is somewhat negative, and displays a low intensity of mood.

low-quality child care and fewer problems when they experienced high-quality child care than young children with an easy temperament (Pluess & Belsky, 2009).

Kagan's Behavioral Inhibition Another way of classifying temperament focuses on the differences between a shy, subdued, timid child and a sociable, extraverted, bold child (Asendorph, 2008). Jerome Kagan (2002, 2008, 2010) regards shyness with strangers (peers or adults) as one feature of a broad temperament category called *inhibition to the unfamiliar.* Inhibited children react to many aspects of unfamiliarity with initial avoidance, distress, or subdued affect, beginning about 7 to 9 months of age.

Kagan has found that inhibition shows considerable stability from infancy through early childhood. One study classified toddlers into extremely inhibited, extremely uninhibited, and intermediate groups (Pfeifer & others, 2002). Follow-up assessments occurred at 4 and 7 years of age. Continuity was demonstrated for both inhibition and lack of inhibition, although a substantial number of the inhibited children moved into the intermediate groups at 7 years of age.

Rothbart and Bates' Classification New classifications of temperament continue to be forged. Mary Rothbart and John Bates (2006) argue that three broad dimensions best represent what researchers have found to characterize the structure of temperament: extraversion/surgency, negative affectivity, and effortful control (self-regulation):

- *Extraversion/surgency* includes "positive anticipation, impulsivity, activity level, and sensation seeking" (Rothbart, 2004, p. 495). Kagan's uninhibited children fit into this category.
- *Negative affectivity* includes "fear, frustration, sadness, and discomfort" (Rothbart, 2004, p. 495). These children are easily distressed; they may fret and cry often. Kagan's inhibited children fit this category.
- *Effortful control (self-regulation)* includes "attentional focusing and shifting, inhibitory control, perceptual sensitivity, and low-intensity pleasure" (Rothbart, 2004, p. 495). Infants who are high on effortful control show an ability to keep their arousal from getting too high and have strategies for soothing themselves. By contrast, children low on effortful control are often unable to control their arousal; they become easily agitated and intensely emotional.

What are some ways that developmentalists have classified infants' temperaments? Which classification makes the most sense to you, based on your observations of infants?

In Rothbart's (2004, p. 497) view, "early theoretical models of temperament stressed the way we are moved by our positive and negative emotions or level of arousal, with our actions driven by these tendencies." The more recent emphasis on effortful control, however, advocates that individuals can engage in a more cognitive, flexible approach to stressful circumstances.

An important point about temperament classifications such as Chess and Thomas' and Rothbart and Bates' is that children should not be pigeon-holed as having only one temperament dimension, such as "difficult" or "negative affectivity." A good strategy when attempting to classify a child's temperament is to think of temperament as consisting of multiple dimensions (Bates, 2008). For example, a child might be extraverted, show little emotional negativity, and have good self-regulation. Another child might be introverted, show little emotional negativity, and have a low level of self-regulation.

The development of temperament capabilities, such as effortful control, allow individual differences to emerge (Bates, 2008). For example, although maturation of the brain's prefrontal lobes must occur for any child's attention to improve and the child to achieve effortful control, some children develop effortful control, others do not. And it is these individual differences in children that are at the heart of what temperament is (Bates, 2008).

Biological Foundations and Experience How does a child acquire a certain temperament? Kagan (2002, 2008, 2010) argues that children inherit a physiology that biases them to have a particular type of temperament. However, through experience they may learn to modify their temperament to some degree. For example, children may inherit a physiology that biases them to be fearful and inhibited, but they learn to reduce their fear and inhibition to some degree.

Biological Influences Physiological characteristics have been linked with different temperaments (Nigg & others, 2010; Rothbart & Bates, 2006; Schmidt & Jetha, 2009). In particular, an inhibited temperament is associated with a unique physiological pattern that includes high and stable heart rate, high level of the hormone cortisol, and high activity in the right frontal lobe of the brain (Kagan, 2008, 2010). This pattern may be tied to the excitability of the amygdala, a structure of the brain that plays an important role in fear and inhibition.

What is heredity's role in the biological foundations of temperament? Twin and adoption studies suggest that heredity has a moderate influence on differences in

developmental **connection**

Nature vs. Nurture. Twin and adoption studies have been used in the effort to sort out hereditary and environmental influences on development. Chapter 2, p. 71

An infant's temperament can vary across cultures. *What do parents need to know about a child's temperament?*

temperament within a group of people (Buss & Goldsmith, 2007; Goldsmith, 2011). The contemporary view is that temperament is a biologically based but evolving aspect of behavior; it evolves as the child's experiences are incorporated into a network of self-perceptions and behavioral preferences that characterize the child's personality (Thompson & Goodvin, 2007).

Gender, Culture, and Temperament Gender may be an important factor shaping the context that influences the fate of temperament (Blakemore, Berenbaum, & Liben, 2009). Parents might react differently to an infant's temperament depending on whether the baby is a boy or a girl. For example, in one study, mothers were more responsive to the crying of irritable girls than to the crying of irritable boys (Crockenberg, 1986).

Similarly, the reaction to an infant's temperament may depend in part on culture (Gartstein & others, 2009; Kagan, 2010). For example, behavioral inhibition is more highly valued in China than in North America, and researchers have found that Chinese children are more inhibited than Canadian infants (Chen & others, 1998). The cultural differences in temperament were linked to parent attitude and behaviors. Canadian mothers of inhibited 2-year-olds were less accepting of their infants' inhibited temperament, whereas Chinese mothers were more accepting.

In short, many aspects of a child's environment can encourage or discourage the persistence of temperament characteristics (Bates & Pettit, 2007). One useful way of thinking about these relationships applies the concept of goodness of fit, which we examine next.

developmental **connection**

Community and Culture. Cross-cultural studies seek to determine culture-universal and culture-specific aspects of development. Chapter 1, p. 11

Goodness of Fit and Parenting **Goodness of fit** refers to the match between a child's temperament and the environmental demands the child must cope with (Thompson, Meyer, & Jochem, 2008). Suppose Jason is an active toddler who is made to sit still for long periods of time and Jack is a slow-to-warm-up toddler who is abruptly pushed into new situations on a regular basis. Both Jason and Jack face a lack of fit between their temperament and environmental demands. Lack of fit can produce adjustment problems (Rothbart & Bates, 2006).

Some temperament characteristics pose more parenting challenges than others, at least in modern Western societies. When children are prone to distress, as exhibited by frequent crying and irritability, their parents may eventually respond by ignoring the child's distress or trying to force the child to "behave." In one research study, though, extra support and training for mothers of distress-prone infants improved the quality of mother-infant interaction (van den Boom, 1989). The training led the mothers to alter their demands on the child, improving the fit between the child and the environment. To read further about some positive strategies for parenting that take into account the child's temperament, see the *Connecting Development to Life* interlude.

developmental **connection**

Personality. Erikson proposed that individuals go through eight stages in the course of human development. Chapter 1, p. 23

PERSONALITY DEVELOPMENT

Emotions and temperament form key aspects of *personality*, the enduring personal characteristics of individuals. Let's now examine characteristics that often are thought of as central to personality development during infancy: trust and the development of self and independence.

Trust According to Erik Erikson (1968), the first year of life is characterized by the trust-versus-mistrust stage of development. Following a life of regularity, warmth, and protection in the mother's womb, the infant faces a world that is less secure.

goodness of fit Refers to the match between a child's temperament and the environmental demands with which the child must cope.

connecting development to life

Parenting and the Child's Temperament

What are the implications of temperamental variations for parenting? Although answers to this question necessarily are speculative, these conclusions regarding the best parenting strategies to use in relation to children's temperament were reached by temperament experts Ann Sanson and Mary Rothbart (1995):

- *Attention to and respect for individuality.* Good parenting involves sensitivity to the child's individual characteristics. A goal might be accomplished in one way with one child and in another way with another child, depending on the child's temperament.
- *Structuring the child's environment.* Crowded, noisy environments can pose greater problems for some children (such as a "difficult child") than others (such as an "easy child"). We might also expect that a fearful, withdrawing child would benefit from slower entry into new contexts.
- *The "difficult child" and packaged parenting programs.* Programs for parents often focus on dealing with children who have "difficult" temperaments. In some cases, "difficult child" refers to Thomas and Chess' description of a child who reacts negatively, cries frequently, engages in irregular daily routines, and is slow to accept change. In others, the concept might be used to describe a child who is irritable, displays anger frequently, does not follow directions well, or some other negative characteristic. Acknowledging that some children are harder than others to parent is often helpful, and advice on how to handle particular difficult characteristics can be useful. However, whether a particular characteristic is difficult depends on its fit with the environment. To label a child "difficult" has the danger of becoming a self-fulfilling prophecy. If a child is identified as "difficult," people may treat the child in a way that actually elicits "difficult" behavior. One recent study did find that having access to experiences that encourage coping and build self-regulatory skills was beneficial to children with a difficult temperament (Bradley & Corwyn, 2008).

Too often, we pigeonhole children into categories without examining the context (Rothbart & Bates, 2006; Saarni, 2002). Nonetheless, caregivers need to take children's temperament into account. Research does not yet allow for many highly specific recommendations, but, in general, caregivers should (1) be sensitive to the individual characteristics of the child, (2) be flexible in responding to these characteristics, and (3) avoid applying negative labels to the child.

How does the advice to "structure the child's environment" relate to what you learned about the concept of "goodness of fit"?

Erikson proposed that infants learn trust when they are cared for in a consistent, warm manner. If the infant is not well fed and kept warm on a consistent basis, a sense of mistrust is likely to develop.

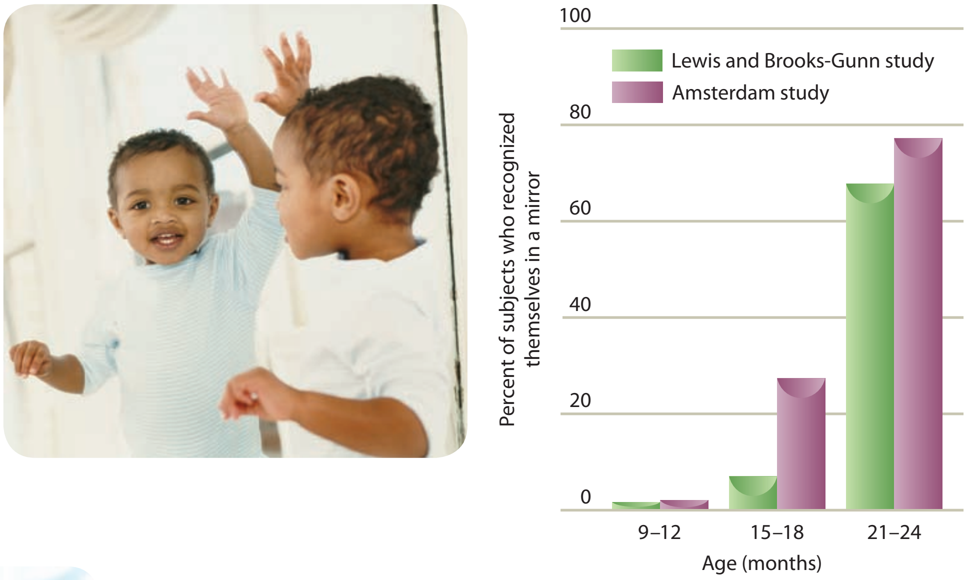
Trust versus mistrust is not resolved once and for all in the first year of life. It arises again at each successive stage of development, which can have positive or negative outcomes. For example, children who leave infancy with a sense of trust can still have their sense of mistrust activated at a later stage, perhaps if their parents are separated or divorced under conflicting circumstances.

The Developing Sense of Self When does the individual begin to sense a separate existence from others? According to leading expert Ross Thompson (2007), studying the self in infancy is difficult mainly because infants cannot tell us how they experience themselves. Infants cannot verbally express their views of the self. They also cannot understand complex instructions from researchers.

One ingenious strategy to test infants' visual self-recognition is the use of a mirror technique, in which an infant's mother first puts a dot of rouge on the infant's nose. Then an observer watches to see how often the infant touches its nose. Next, the infant is placed in front of a mirror, and observers detect whether nose touching increases. Why does this matter? The idea is that increased nose touching indicates that the infant recognizes the self in the mirror and is trying to touch or rub off the rouge because the rouge violates the infant's view of the self. Increased touching indicates that the infant realizes that it is the self in the mirror but that something is not right since the real self does not have a dot of rouge on it.

FIGURE **6.5**

THE DEVELOPMENT OF SELF-RECOGNITION IN INFANCY. The graph shows the findings of two studies in which infants less than 1 year of age did not recognize themselves in the mirror. A slight increase in the percentage of infant self-recognition occurred around 15 to 18 months of age. By 2 years of age, a majority of children recognized themselves. *Why do researchers study whether infants recognize themselves in a mirror?*



Erikson believed that autonomy versus shame and doubt is the key developmental theme of the toddler years. *What are some good strategies for parents to use with their toddlers?*

Figure 6.5 displays the results of two investigations that used the mirror technique. The researchers found that before they were 1 year old, infants did not recognize themselves in the mirror (Amsterdam, 1968; Lewis & Brooks-Gunn, 1979). Signs of self-recognition began to appear among some infants when they were 15 to 18 months old. By the time they were 2 years old, most children recognized themselves in the mirror. In sum, infants begin to develop a self-understanding called self-recognition at approximately 18 months of age (Hart & Karmel, 1996; Lewis, 2005).

However, mirrors are not familiar to infants in all cultures (Rogoff, 2003). Thus, physical self-recognition may be a more important marker of self-recognition in Western than non–Western cultures (Thompson & Virmani, 2010). Supporting this cultural variation view, one study revealed that 18- to 20-month-old toddlers from urban middle SES German families were more likely to recognize their mirror images than were toddlers from rural Cameroon farming families (Keller & others, 2005).

Late in the second year and early in the third year, toddlers show other emerging forms of self-awareness that reflect a sense of "me" (Laible & Thompson, 2007; Thompson & Virmani, 2010). For example, they refer to themselves such as by saying "me big"; they label their internal experiences such as emotions; they monitor themselves as when a toddler says, "do it myself"; and say that things are theirs (Bates, 1990; Fasig, 2000).

Independence Erik Erikson (1968) stressed that independence is an important issue in the second year of life. Erikson describes the second stage of development as the stage of autonomy versus shame and doubt. Autonomy builds as the infant's mental and motor abilities develop. At this point in development, not only can infants walk, but they can also climb, open and close, drop, push and pull, and hold and let go. Infants feel pride in these new accomplishments and want to do everything themselves, whether the activity is flushing a toilet, pulling the wrapping off a package, or deciding what to eat. It is important for parents to recognize the motivation of toddlers to do what they are capable of doing at their own pace. Then they can learn to control their muscles and their impulses themselves. But when caregivers are impatient and do for toddlers what they are capable of doing themselves, shame and doubt develop. Every parent has rushed a

developmental **connection**

Personality. Two key points in development when there is a strong push for independence are the second year of life and early adolescence. Chapter 12, p. 389

child from time to time. It is only when parents consistently overprotect toddlers or criticize accidents (wetting, soiling, spilling, or breaking, for example) that children develop an excessive sense of shame and doubt about their ability to control themselves and their world. As we discuss in later chapters, Erikson emphasized that the stage of autonomy versus shame and doubt has important implications for the individual's future development.

Review *Connect* Reflect

LG1 Discuss the development of emotions and personality in infancy.

Review

- What are emotions? What is the nature of an infant's emotions and how do they change?
- What is temperament, and how does it develop in infancy?
- What are some important aspects of personality in infancy, and how do they develop?

Connect

- Earlier in this section, you read that the early development of the hippocampus in infants plays a role in their emotions. In Chapter 5, we found out the early development of the hippocampus was also connected to a particular cognitive function. What was it?

Reflect *Your Own Personal Journey of Life*

- How would you describe your temperament? Does it fit one of Chess and Thomas' three styles—easy, slow to warm up, or difficult? If you have siblings, is your temperament similar or different than theirs?

2 Social Orientation/Understanding and Attachment

LG2 Describe social orientation/understanding and the development of attachment in infancy.

Social Orientation/Understanding

Attachment and Its Development

Individual Differences in Attachment

Caregiving Styles and Attachment

So far, we have discussed how emotions and emotional competence change as children develop. We have also examined the role of emotional style; in effect, we have seen how emotions set the tone of our experiences in life. But emotions also write the lyrics because they are at the core of our relationships with others.

SOCIAL ORIENTATION/UNDERSTANDING

As socioemotional beings, infants show a strong interest in the social world and are motivated to orient to it and understand it. In earlier chapters, we described many of the biological and cognitive foundations that contribute to the infant's development of social orientation and understanding. In this chapter, we will call attention to relevant biological and cognitive factors as we explore social orientation; locomotion; intention, goal-directed behavior, and cooperation; and social referencing. Discussing biological, cognitive, and social processes together reminds us of an important aspect of development that was pointed out in Chapter 1: These processes are intricately intertwined (Diamond, 2009).

developmental **connection**

Life-Span Perspective. Biological, cognitive, and socioemotional processes are often linked as individuals go through the life span. Chapter 1, p. 15

Social Orientation From early in their development, infants are captivated by the social world. As we discussed in our coverage of infant perception in Chapter 4, young infants stare intently at faces and are attuned to the sounds of human voices,

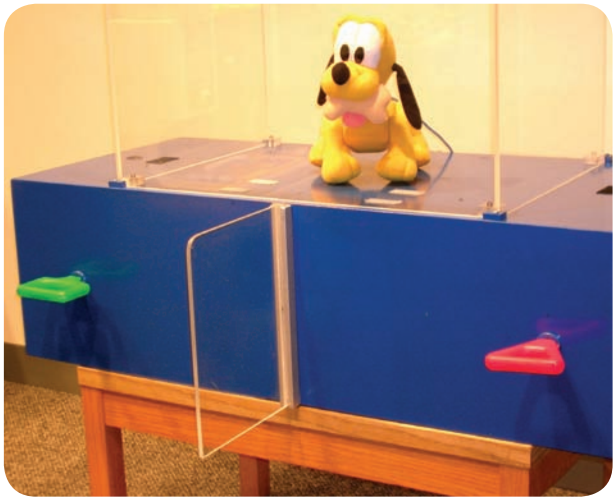


FIGURE **6.6**

THE COOPERATION TASK. The cooperation task consisted of two handles on a box, atop which was an animated musical toy, surreptitiously activated by remote control when both handles were pulled. The handles were placed far enough apart that one child could not pull both handles. The experimenter demonstrated the task, saying, "Watch! If you pull the handles, the doggie will sing" (Brownell, Ramani, & Zerwas, 2006).

A mother and her baby engaging in face-to-face play. *At what age does face-to-face play usually begin, and when does it typically start decreasing in frequency?*

developmental **connection**

Biological Processes. The dynamic systems view is increasingly accepted as an important view in explaining how infants develop. Chapter 4, p. 127

especially their caregiver's (Ramsay-Rennels & Langlois, 2007). Later, they become adept at interpreting the meaning of facial expressions.

Face-to-face play often begins to characterize caregiver-infant interactions when the infant is about 2 to 3 months of age. The focused social interaction of face-to-face play may include vocalizations, touch, and gestures (Leppanen & others, 2007). Such play is part of many mothers' motivation to create a positive emotional state in their infants (Thompson, 2009a, b).

In part because of such positive social interchanges between caregivers and infants, by 2 to 3 months of age, infants respond differently to people than objects, showing more positive emotion to people than to inanimate objects, such as puppets (Legerstee, 1997). At this age, most infants expect people to react positively when the infants initiate a behavior, such as a smile or a vocalization. This finding has been discovered using a method called the *still-face paradigm*, in which the caregiver alternates between engaging in face-to-face interaction with the infant and remaining still and unresponsive (Conradt & Ablow, 2010; Johnson, 2010). As early as 2 to 3 months of age, infants show more withdrawal, negative emotions, and self-directed behavior when their caregivers are still and unresponsive (Adamson & Frick, 2003). The frequency of face-to-face play decreases after 7 months of age as infants become more mobile (Thompson, 2006). A recent meta-analysis revealed that infants' higher positive affect and lower negative affect as displayed during the still-face paradigm were linked to secure attachment at one year of age (Mesman, van IJzendoorn, & Bakersman-Kranenburg, 2009).

Infants also learn about the social world through contexts other than face-to-face play with a caregiver (Stern, 2010; Tronick, 2010). Even though infants as young as 6 months of age show an interest in each other, their interaction with peers increases considerably in the last half of the second year. Between 18 to 24 months of age, children markedly increase their imitative and reciprocal play, such as imitating nonverbal actions like jumping and running (Eckerman & Whitehead, 1999). One recent study involved presenting 1- and 2-year-olds with a simple cooperative task that consisted of pulling a lever to get an attractive toy (Brownell, & Ramani, & Zerwas, 2006) (see Figure 6.6). Any coordinated actions of the 1-year-olds appeared to be more coincidental rather than cooperative, whereas the 2-year-olds' behavior was characterized as more active cooperation to reach a goal.

Locomotion Recall from earlier in the chapter how important independence is for infants, especially in the second year of life. As infants develop the ability to crawl, walk, and run, they are able to explore and expand their social world. These newly developed, self-produced locomotor skills allow the infant to independently initiate social interchanges on a more frequent basis (Laible & Thompson, 2007). Remember from Chapter 4 that the development of these gross motor skills is the result of a number of factors including the development of the nervous system, the goal the infant is motivated to reach, and environmental support for the skill (Adolph & Joh, 2009).

The infant's and toddler's push for independence also is likely paced by the development of locomotion skills (Campos, 2009). Of further importance is locomotion's motivational implications (Thompson, 2008). Once infants have the ability to move in goal-directed pursuits, the reward from these pursuits leads to further efforts to explore and develop skills.

Intention and Goal-Directed Behavior Perceiving people as engaging in intentional and goal-directed behavior is an important social cognitive accomplishment, and this initially occurs toward the end of the first year (Laible & Thompson, 2007; Thompson, 2006). Joint attention and gaze-following help the infant to understand that other people have intentions (Meltzoff & Brooks, 2009). Recall from Chapter 5 that *joint attention* occurs when the caregiver and infant focus on the same object or event. We indicated that emerging aspects of joint attention occur at about 7 to 8 months, but at about 10 to 11 months of age joint attention intensifies and infants begin to follow the caregiver's gaze. By their first birthday, infants have begun to direct the caregiver's attention to objects that capture their interest (Heimann & others, 2006).

Social Referencing Another important social cognitive accomplishment in infancy is developing the ability to "read" the emotions of other people (Kim, Walden, & Knieps, 2010). **Social referencing** is the term used to describe "reading" emotional cues in others to help determine how to act in a particular situation. The development of social referencing helps infants to interpret ambiguous situations more accurately, as when they encounter a stranger and need to know whether to fear the person (Thompson, 2006). By the end of the first year, a mother's facial expression—either smiling or fearful—influences whether an infant will explore an unfamiliar environment.

Infants become better at social referencing in the second year of life. At this age, they tend to "check" with their mother before they act; they look at her to see if she is happy, angry, or fearful. For example, in one study 14- to 22-month-old infants were more likely to look at their mother's face as a source of information for how to act in a situation than were 6- to 9-month-old infants (Walden, 1991).

Infants' Social Sophistication and Insight In sum, researchers are discovering that infants are more socially sophisticated and insightful at younger ages than previously envisioned (Thompson, 2010; Tronick, 2010). This sophistication and insight is reflected in infants' perceptions of others' actions as intentionally motivated and goal-directed and their motivation to share and participate in that intentionality by their first birthday. The more advanced social cognitive skills of infants likely influence their understanding and awareness of attachment to a caregiver.

What is social referencing? What are some developmental changes in social referencing?

ATTACHMENT AND ITS DEVELOPMENT

Attachment is a close emotional bond between two people. There is no shortage of theories about infant attachment. Three theorists discussed in Chapter 1—Freud, Erikson, and Bowlby—proposed influential views.

Freud emphasized that infants become attached to the person or object that provides oral satisfaction. For most infants, this is the mother, since she is most likely to feed the infant. Is feeding as important as Freud thought? A classic study by Harry Harlow (1958) reveals that the answer is no (see Figure 6.7).

Harlow removed infant monkeys from their mothers at birth; for six months they were reared by surrogate (substitute) "mothers." One surrogate mother was made of wire, the other of cloth. Half of the infant monkeys were fed by the wire mother, half by the cloth mother. Periodically, the amount of time the infant monkeys spent with either the wire or the cloth mother was computed. Regardless of which mother fed them, the infant monkeys spent far more time with the cloth mother. Even if the wire mother, but not the cloth mother, provided nourishment, the infant monkeys spent more time with the cloth mother. And when Harlow frightened the monkeys, those "raised" by the cloth mother ran to the mother and clung to it; those raised by the wire mother did not. Whether the mother provided comfort seemed to determine whether the monkeys associated the mother with security. This study clearly demonstrated that feeding is not the crucial element in the attachment process and that contact comfort is important.

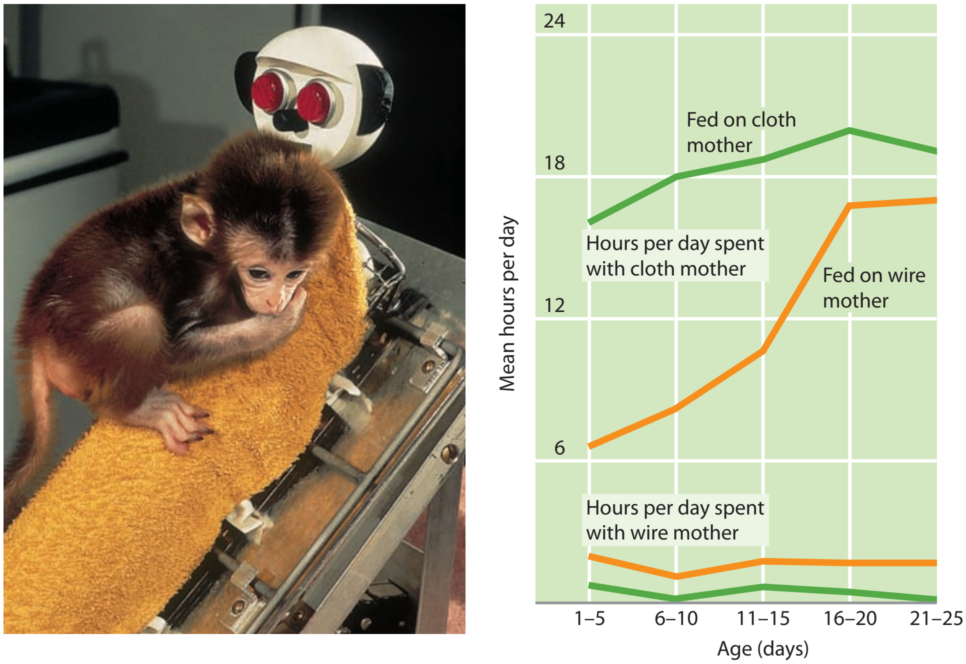
Physical comfort also plays a role in Erik Erikson's (1968) view of the infant's development. Recall Erikson's proposal that the first year of life represents the stage of trust versus mistrust. Physical comfort and sensitive care, according to Erikson

social referencing "Reading" emotional cues in others to help determine how to act in a particular situation.

attachment A close emotional bond between two people.

FIGURE **6.7**

CONTACT TIME WITH WIRE AND CLOTH SURROGATE MOTHERS. Regardless of whether the infant monkeys were fed by a wire or a cloth mother, they overwhelmingly preferred to spend contact time with the cloth mother. *How do these results compare with what Freud's theory and Erikson's theory would predict about human infants?*



(1968), are key to establishing a basic trust in infants. The infant's sense of trust, in turn, is the foundation for attachment and sets the stage for a lifelong expectation that the world will be a good and pleasant place to be.

The ethological perspective of British psychiatrist John Bowlby (1969, 1989) also stresses the importance of attachment in the first year of life and the responsiveness of the caregiver. Bowlby maintains both infants and their primary caregivers are biologically predisposed to form attachments. He argues that the newborn is biologically equipped to elicit attachment behavior. The baby cries, clings, coos, and smiles. Later, the infant crawls, walks, and follows the mother. The immediate result is to keep the primary caregiver nearby; the long-term effect is to increase the infant's chances of survival.

In Bowlby's model, what are the four stages of attachment?

Attachment does not emerge suddenly but rather develops in a series of phases, moving from a baby's general preference for human beings to a partnership with primary caregivers. Following are four such phases based on Bowlby's conceptualization of attachment (Schaffer, 1996):

- *Phase 1: From birth to 2 months.* Infants instinctively direct their attachment to human figures. Strangers, siblings, and parents are equally likely to elicit smiling or crying from the infant.
- *Phase 2: From 2 to 7 months.* Attachment becomes focused on one figure, usually the primary caregiver, as the baby gradually learns to distinguish familiar from unfamiliar people.
- *Phase 3: From 7 to 24 months.* Specific attachments develop. With increased locomotor skills, babies actively seek contact with regular caregivers, such as the mother or father.
- *Phase 4: From 24 months on.* Children become aware of others' feelings, goals, and plans and begin to take these into account in forming their own actions.

Bowlby argued that infants develop an *internal working model* of attachment, a simple mental model of the caregiver, their relationship, and the self as deserving of nurturant care. The infant's internal working model of attachment with the caregiver influences the infant's and later the child's subsequent responses to other people (Bretherton & Munholland, 2008). The internal model of attachment also has played a pivotal role in the discovery of links between attachment and subsequent emotional understanding, conscience development, and self-concept (Thompson, 2006).

Strange Situation An observational measure of infant attachment that requires the infant to move through a series of introductions, separations, and reunions with the caregiver and an adult stranger in a prescribed order.

securely attached babies Babies that use the caregiver as a secure base from which to explore the environment.

insecure avoidant babies Babies that show insecurity by avoiding the caregiver.

INDIVIDUAL DIFFERENCES IN ATTACHMENT

Although attachment to a caregiver intensifies midway through the first year, isn't it likely that that quality of babies' attachment experiences varies? Mary Ainsworth (1979) thought so. Ainsworth created the **Strange Situation,** an observational measure of infant attachment in which the infant experiences a series of introductions, separations, and reunions with the caregiver and an adult stranger in a prescribed order. In using the Strange Situation, researchers hope that their observations will provide information about the infant's motivation to be near the caregiver and the degree to which the caregiver's presence provides the infant with security and confidence.

Based on how babies respond in the Strange Situation, they are described as being securely attached or insecurely attached (in one of three ways) to the caregiver:

- **Securely attached babies** use the caregiver as a secure base from which to explore the environment. When in the presence of their caregiver, securely attached infants explore the room and examine toys that have been placed in it. When the caregiver departs, securely attached infants might mildly protest, and when the caregiver returns these infants reestablish positive interaction with her, perhaps by smiling or climbing on her lap. Subsequently, they often resume playing with the toys in the room.
- **Insecure avoidant babies** show insecurity by avoiding the caregiver. In the Strange Situation, these babies engage in little interaction with the caregiver, are not distressed when she leaves the room, usually do not reestablish contact with on her return, and may even turn their back on her. If contact is established, the infant usually leans away or looks away.
- **Insecure resistant babies** often cling to the caregiver and then resist her by fighting against the closeness, perhaps by kicking or pushing away. In the Strange Situation, these babies often cling anxiously to the caregiver and don't explore the playroom. When the caregiver leaves, they often cry loudly and push away if she tries to comfort them on her return.
- **Insecure disorganized babies** are disorganized and disoriented. In the Strange Situation, these babies might appear dazed, confused, and fearful. To be classified as disorganized, babies must show strong patterns of avoidance and resistance or display certain specified behaviors, such as extreme fearfulness around the caregiver.

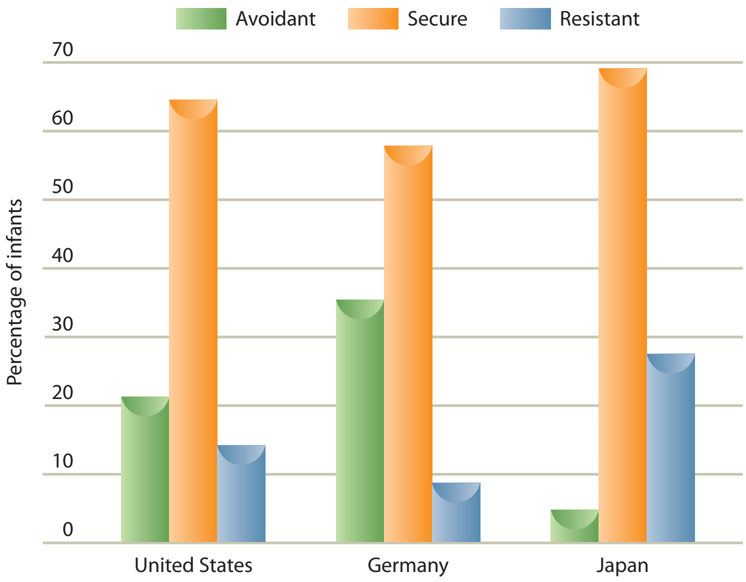


FIGURE **6.8**

CROSS-CULTURAL COMPARISON OF ATTACHMENT. In one study, infant attachment in three countries—the United States, Germany, and Japan—was measured in the Ainsworth Strange Situation (van IJzendoorn & Kroonenberg, 1988). The dominant attachment pattern in all three countries was secure attachment. However, German infants were more avoidant and Japanese infants were less avoidant and more resistant than U.S. infants. *What are some explanations for differences in how German, Japanese, and American infants respond to the Strange Situation?*

Evaluating the Strange Situation Does the Strange Situation capture important differences among infants? As a measure of attachment, it may be culturally biased. For example, German and Japanese babies often show different patterns of attachment than American infants. As illustrated in Figure 6.8, German infants are more likely to show an avoidant attachment pattern and Japanese infants are less likely to display this pattern than U.S. infants (van IJzendoorn & Kroonenberg, 1988). The avoidant pattern in German babies likely occurs because their caregivers encourage them to be independent (Grossmann & others, 1985). Also as shown in Figure 6.8, Japanese babies are more likely than American babies to be categorized as resistant. This may have more to do with the Strange Situation as a measure of attachment than with attachment insecurity itself. Japanese mothers rarely let anyone unfamiliar with their babies care for them. Thus, the Strange Situation might

insecure resistant babies Babies that often cling to the caregiver, then resist the caregiver by fighting against the closeness, perhaps by kicking or pushing away.

insecure disorganized babies Babies that show insecurity by being disorganized and disoriented.

create considerably more stress for Japanese infants than for American infants, who are more accustomed to separation from their mothers (Miyake, Chen, & Campos, 1985). Even though there are cultural variations in attachment classification, the most frequent classification in every culture studied so far is secure attachment (Thompson, 2006; van IJzendoorn & Kroonenberg, 1988).

Interpreting Differences in Attachment Do individual differences in attachment matter? Ainsworth argues that secure attachment in the first year of life provides an important foundation for psychological development later in life. The securely attached infant moves freely away from the mother but keeps track of where she is through periodic glances. The securely attached infant responds positively to being picked up by others, and when put back down, freely moves away to play. An insecurely attached infant, by contrast, avoids the mother or is ambivalent toward her, fears strangers, and is upset by minor, everyday separations.

developmental **connection**

Attachment. How might secure and insecure attachment be reflected in the relationships of young adults? Chapter 14, p. 448

If early attachment to a caregiver is important, it should relate to a child's social behavior later in development. For some children, early attachments seem to foreshadow later functioning. In the extensive longitudinal study conducted by Alan Sroufe and his colleagues (2005), early secure attachment (assessed by the Strange Situation at 12 and 18 months) was linked with positive emotional health, high self-esteem, self-confidence, and socially competent interaction with peers, teachers, camp counselors, and romantic partners through adolescence. Another study revealed that being classified as insecure resistant in infancy was a negative predictor of cognitive development in elementary school (O'Connor & McCartney, 2007). Yet another study found that attachment security at 24 and 36 months was linked to the child's enhanced social problem-solving skills at 54 months (Raikes & Thompson, 2009). And a recent meta-analysis found that disorganized attachment was more strongly linked to externalizing problems (aggression, hostility, opposition problems, for example) than were avoidant attachment and resistant attachment (Fearon & others, 2010).

For some children, though, there is little continuity (Thompson, 2008). Not all research reveals the power of infant attachment to predict subsequent development. In one longitudinal study, attachment classification in infancy did not predict attachment classification at 18 years of age (Lewis, Feiring, & Rosenthal, 2000). In this study, the best predictor of an insecure attachment classification at 18 was the occurrence of parental divorce in the intervening years. Consistently positive caregiving over a number of years is likely an important factor in connecting early attachment and the child's functioning later in development. Indeed, researchers have found that early secure attachment *and* subsequent experiences, especially maternal care and life stresses, are linked with children's later behavior and adjustment (Thompson, 2008).

Some developmentalists conclude that too much emphasis has been placed on the attachment bond in infancy (Newcombe, 2007). Jerome Kagan (1987, 2002), for example, points out that infants are highly resilient and adaptive; he argues that they are evolutionarily equipped to stay on a positive developmental course, even in the face of wide variations in parenting. Kagan and others stress that genetic characteristics and temperament play more important roles in a child's social competence than the attachment theorists, such as Bowlby and Ainsworth, are willing to acknowledge (Bakermans-Kranenburg & others, 2007). For example, if some infants inherit a low tolerance for stress, this, rather than an insecure attachment bond, may be responsible for an inability to get along with peers. A recent study found links between disorganized attachment in infancy, a specific gene, and level of maternal responsiveness. In this study, a disorganized attachment style developed in infancy only when infants had the short version of the serotonin transporter gene—5-HTTLPR (Spangler & others, 2009). Infants were not characterized by this attachment style when they had the long version of the gene (Spangler & others, 2009). Further, this gene-environment interaction only occurred when mothers showed a low level of responsiveness toward their infants.

developmental **connection**

Nature vs. Nurture. What is involved in gene × environment (G × E) interaction? Chapter 2, p. 74

Another criticism of attachment theory is that it ignores the diversity of socializing agents and contexts that exists in an infant's world. A culture's value system can influence the nature of attachment (Grossman & others, 2008). In some cultures, infants show attachments to many people. Among the Hausa (who live in Nigeria), both grandmothers and siblings provide a significant amount of care for infants (Harkness & Super, 1995). Infants in agricultural societies tend to form attachments to older siblings, who are assigned a major responsibility for younger siblings' care. Researchers recognize the importance of competent, nurturant caregivers in an infant's development (Gauvain & Parke, 2010); at issue, though, is whether or not secure attachment, especially to a single caregiver, is critical (Lamb, 2010; Thompson, 2006).

Despite such criticisms, there is ample evidence that security of attachment is important to development (Thompson & Newton, 2009; Sroufe, Coffine, & Carlson, 2010). Secure attachment in infancy is important because it reflects a positive parent-infant relationship and provides the foundation that supports healthy socioemotional development in the years that follow.

In the Hausa culture, siblings and grandmothers provide a significant amount of care for infants. *How might these variations in care affect attachment?*

CAREGIVING STYLES AND ATTACHMENT

Is the style of caregiving linked with the quality of the infant's attachment? Securely attached babies have caregivers who are sensitive to their signals and are consistently available to respond to their infants' needs (Bigelow & others, 2010). These caregivers often let their babies have an active part in determining the onset and pacing of interaction in the first year of life. A recent study revealed that maternal sensitive responding was linked to infant attachment security (Finger & others, 2009). Another study found that maternal sensitivity in parenting was related with secure attachment in infants in two different cultures: the United States and Colombia (Carbonell & others, 2002). Although maternal sensitivity is positively linked to the development of secure attachment in infancy, it is important to note that the link is not especially strong (Campos, 2009).

How do the caregivers of insecurely attached babies interact with them? Caregivers of avoidant babies tend to be unavailable or rejecting (Bakermans-Kranenburg & others, 2007). They often don't respond to their babies' signals and have little physical contact with them. When they do interact with their babies, they may behave in an angry and irritable way. Caregivers of resistant babies tend to be inconsistent; sometimes they respond to their babies' needs, and sometimes they don't. In general, they tend not to be very affectionate with their babies and show little synchrony when interacting with them. Caregivers of disorganized babies often neglect or physically abuse them (Lyons-Ruth & Jacobvitz, 2008). In some cases, these caregivers are depressed (Thompson, 2008).

Review *Connect* Reflect

LG2 Describe social orientation/understanding and the development of attachment in infancy.

Review

- How do infants orient to the social world?
- What is attachment, and how is it conceptualized?
- What are some individual variations in attachment? What are some criticisms of attachment theory?
- How are caregiving styles related to attachment?

Connect

- Do the different theories of attachment you just read about complement or contradict each other? Describe how the concept of nature vs. nurture is involved.

Reflect *Your Own Personal Journey of Life*

- What can you do as a parent to improve the likelihood that your baby will have a secure attachment with you?

3 Social Contexts

LG3 Explain how social contexts influence the infant's development.

The Family

Child Care

Now that we have explored the infant's emotional and personality development and attachment, let's examine the social contexts in which these occur. We will begin by studying a number of aspects of the family and then turn to a social context in which infants increasingly spend time—child care.

Children socialize parents just as parents socialize children.

THE FAMILY

The family can be thought of as a constellation of subsystems—a complex whole made up of interrelated, interacting parts—defined in terms of generation, gender, and role. Each family member participates in several subsystems (Parke & others, 2008). The father and child represent one subsystem, the mother and father another; the mother-father-child represent yet another; and so on.

These subsystems have reciprocal influences on each other, as Figure 6.9 highlights. For example, Jay Belsky (1981) emphasizes that marital relations, parenting, and infant behavior and development can have both direct and indirect effects on each other. An example of a direct effect is the influence of the parents' behavior on the child. An indirect effect is how the relationship between the spouses mediates the way a parent acts toward the child (Schact, Cummings, & Davies, 2009). For example, marital conflict might reduce the efficiency of parenting, in which case marital conflict would indirectly affect the child's behavior. The simple fact that two people are becoming parents may have profound effects on their relationship.

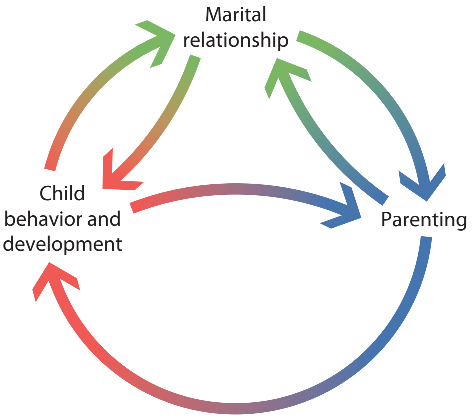


FIGURE **6.9**

INTERACTION BETWEEN CHILDREN AND THEIR PARENTS: DIRECT AND INDIRECT EFFECTS

The Transition to Parenthood When people become parents through pregnancy, adoption, or stepparenting, they face disequilibrium and must adapt. Parents want to develop a strong attachment with their infant, but they still want to maintain strong attachments to their spouse and friends, and possibly continue their careers. Parents ask themselves how this new being will change their lives. A baby places new restrictions on partners; no longer will they be able to rush out to a movie on a moment's notice, and money may not be readily available for vacations and other luxuries. Dual-career parents ask, "Will it harm the baby to place her in child care? Will we be able to find responsible babysitters?"

In a longitudinal investigation of couples from late pregnancy until 3½ years after the baby was born, couples enjoyed more positive marital relations before the baby was born than after (Cowan & Cowan, 2000; Cowan & others, 2005). Still, almost one-third showed an increase in marital satisfaction. Some couples said that the baby had both brought them closer together and moved them farther apart; being parents enhanced their sense of themselves and gave them a new, more stable identity as a couple. Babies opened men up to a concern with intimate relationships, and the demands of juggling work and family roles stimulated women to manage family tasks more efficiently and pay attention to their own personal growth.

The Bringing Home Baby project is a workshop for new parents that emphasizes strengthening the couples' relationship, understanding and becoming acquainted with the baby, resolving conflict, and developing parenting skills. Evaluations of the project revealed that parents who participated improved in their ability to work together as parents, fathers were more involved with their baby and sensitive to the baby's behavior, mothers had a lower incidence of postpartum depression symptoms, and their baby showed better overall development than participants in a control group (Gottman, Shapiro, & Parthemer, 2004; Shapiro & Gottman, 2005).

What kinds of adaptations do new parents need to make?

Reciprocal Socialization For many years, socialization between parents and children was viewed as a one-way process: Children were considered to be the products of their parents' socialization techniques. However, parent-child interaction is reciprocal (Gauvain & Parke, 2010; Grusec, 2011). **Reciprocal socialization** is socialization that is bidirectional. That is, children socialize parents just as parents socialize children. For example, the interaction of mothers and their infants is like a dance or a dialogue in which successive actions of the partners are closely coordinated. This coordinated dance or dialogue can assume the form of mutual synchrony in which each person's behavior depends on the partner's previous behavior. Or it can be reciprocal in the sense that actions of the partners are matched, as when one partner imitates the other or when there is mutual smiling.

When reciprocal socialization has been studied in infancy, mutual gaze, or eye contact, plays an important role in early social interaction (Moore & others, 2009; Stern, 2010). In one investigation, the mother and infant engaged in a variety of behaviors while they looked at each other (Stern & others, 1977). By contrast, when they looked away from each other, the rate of such behaviors dropped considerably. In sum, the behaviors of mothers and infants involve substantial interconnection, mutual regulation, and synchronization (Treyvaud & others, 2009; Tronick, 2010). A recent study revealed that *parent-infant synchrony*—the temporal coordination of social behavior—played an important role in children's development (Feldman, 2007). In this study, parent-infant synchrony at 3 and 9 months of age were positively linked to children's self-regulation from 2 to 6 years of age.

An important form of reciprocal socialization is **scaffolding,** in which parents time interactions in such a way that the infant experiences turn-taking with the parents. Scaffolding involves parental behavior that supports children's efforts, allowing them to be more skillful than they would be if they were to rely only on their own abilities (Field, 2007). In using scaffolding, caregivers provide a positive, reciprocal framework in which they and their children interact. For example, in the game peek-a-boo, the mother initially covers the baby. Then she removes the cover and registers "surprise" at the infant's reappearance. As infants become more skilled at peek-a-boo, pat-a-cake, and so on, there are other caregiver games that exemplify scaffolding and turn-taking sequences. Engaging in turn-taking and games like peek-a-boo reflect the development of joint attention by the caregiver and infant, which we discussed in Chapter 5 (Tomasello, 2008).

Maternal and Paternal Caregiving An increasing number of U.S. fathers stay home full-time with their children (Lamb, 2010). As indicated in Figure 6.10, there was a 300-plus percent increase in stay-at-home fathers in the United States from 1996 to 2006. A large portion of the full-time fathers have career-focused wives who provide the main family income. A recent study revealed that the stay-at-home fathers were as satisfied with their marriage as traditional parents, although they indicated that they missed their daily life in the workplace (Rochlen & others, 2008). In this study, the stay-at-home fathers reported that they tended to be ostracized when they took their children to playgrounds and often were excluded from parent groups.

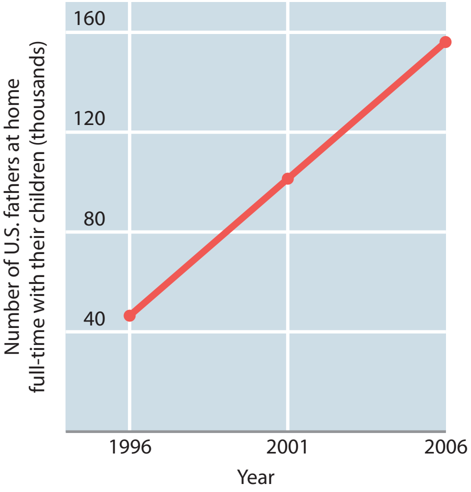


FIGURE **6.10**

THE INCREASE IN THE NUMBER OF U.S. FATHERS STAYING AT HOME FULL-TIME WITH THEIR CHILDREN

Caregivers often play games such as peek-a-boo and pat-a-cake. *How is scaffolding involved in these games?*

developmental **connection**

Cognitive Theory. A version of scaffolding is an important aspect of Lev Vygotksy's sociocultural cognitive theory of development. Chapter 7, p. 220

reciprocal socialization Socialization that is bidirectional; children socialize parents, just as parents socialize children.

scaffolding Parents time interactions so that infants experience turn-taking with the parents.

An Aka pygmy father with his infant son. In the Aka culture, fathers were observed to be holding or nearby their infants 47 percent of the time (Hewlett, 1991).

Can fathers take care of infants as competently as mothers can? Observations of fathers and their infants suggest that fathers have the ability to act as sensitively and responsively as mothers with their infants (Lamb, 2010; Parke & others, 2008). Consider the Aka pygmy culture in Africa where fathers spend as much time interacting with their infants as do their mothers (Hewlett, 1991, 2000; Hewlett & MacFarlan, 2010). Remember, however, that although fathers can be active, nurturant, involved caregivers with their infants, as Aka pygmy fathers are, in many cultures men have not chosen to follow this pattern (Cohen, 2009; Parkinson, 2010).

Do fathers behave differently toward infants than mothers do? Maternal interactions usually center on child-care activities—feeding, changing diapers, bathing. Paternal interactions are more likely to include play (Parke & Buriel, 2006). Fathers engage in more rough-and-tumble play. They bounce infants, throw them up in the air, tickle them, and so on (Lamb, 2000). Mothers do play with infants, but their play is less physical and arousing than that of fathers.

How do most fathers and mothers interact differently with infants?

In one study, fathers were interviewed about their caregiving responsibilities when their children were 6, 15, 24, and 36 months of age (NICHD Early Child Care Research Network, 2000). Some of the fathers were videotaped while playing with their children at 6 and 36 months. Fathers were more involved in caregiving—bathing, feeding, dressing the child, taking the child to child care, and so on—when they worked fewer hours and mothers worked more hours, when mothers and fathers were younger, when mothers reported greater marital intimacy, and when the children were boys.

CHILD CARE

Many U.S. children today experience multiple caregivers. Most do not have a parent staying home to care for them; instead, the children have some type of care provided by others—"child care." Many parents worry that child care will reduce their infants' emotional attachment to them, retard the infants' cognitive development, fail to teach them how to control anger, and allow them to be unduly influenced by their peers. How extensive is child care? Are the worries of these parents justified?

Parental Leave Today far more young children are in child care than at any other time in history. About 2 million children in the United States currently receive formal, licensed child care, and uncounted millions of children are cared for by unlicensed babysitters. In part, these numbers reflect the fact that U.S. adults cannot receive paid leave from their jobs to care for their young children. However, child-care policies around the world vary in eligibility criteria, leave duration, benefit level, and the extent to which parents take advantage of the policies (Tolani & Brooks-Gunn, 2008). There are five types of parental leave from employment (Kammerman, 1989, 2000a, b):

- *Maternity leave.* In some countries the pre-birth leave is compulsory as is a 6- to 10-week leave following birth.
- *Paternity leave.* This is usually much briefer than maternity leave. It may be especially important when a second child is born and the first child requires care.
- *Parental leave.* This gender-neutral leave usually follows a maternity leave and allows either women or men to share the leave policy or choose which of them will use it. In 1998, the European Union mandated a three-month parental leave.
- *Child-rearing leave.* In some countries, this is a supplement to a maternity leave or a variation on a parental leave. A child-rearing leave is usually

longer than a maternity leave and is typically paid at a much lower level.

- *Family leave.* This covers reasons other than the birth of a new baby and can allow time off from employment to care for an ill child or other family members, time to accompany a child to school for the first time, or time to visit a child's school.

Europe led the way in creating new standards of parental leave: The European Union (EU) mandated a paid 14-week maternity leave in 1992. In most European countries today, working parents on leave receive from 70 percent of the worker's prior wage to the full wage and paid leave averages about 16 weeks (Tolani & Brooks-Gunn, 2008). The United States currently allows up to 12 weeks of unpaid leave for caring for a newborn. Most countries restrict eligible benefits to women employed for a minimum time prior to childbirth (Tolani & Brooks-Gunn, 2008). In Denmark, even unemployed mothers are eligible for extended parental leave related to childbirth. In Germany child-rearing leave is available to almost all parents. The Nordic countries (Denmark, Norway, and Sweden) have extensive gender-equity, family-leave policies for childbirth that emphasize the contributions of both women and men (Tolani & Brooks-Gunn, 2008). For example, in Sweden parents can take an 18-month, job-protected parental leave with benefits, which can be shared by parents and applied to full-time or part-time work.

How are child-care policies in many European countries, such as Sweden, different than those in the United States?

Variations in Child Care Because the United States does not have a policy of paid leave for child care, child care in the United States has become a major national concern (Phillips & Lowenstein, 2011). Many factors influence the effects of child care, including the age of the child, the type of child care, and the quality of the program.

In the United States, approximately 15 percent of children 5 years of age and younger attend more than one child-care arrangement. A recent study of 2- and 3-year-old children revealed that an increase in the number of child-care arrangements the children experienced was linked to an increase in behavioral problems and a decrease in prosocial behavior (Morrissey, 2009).

The type of child care varies extensively (McCartney & others, 2010). Child care is provided in large centers with elaborate facilities and in private homes. Some child-care centers are commercial operations; others are nonprofit centers run by churches, civic groups, and employers. Some child-care providers are professionals; others are mothers who want to earn extra money. Figure 6.11 presents the primary care arrangements for children under 5 years of age with employed mothers (Clarke-Stewart & Miner, 2008).

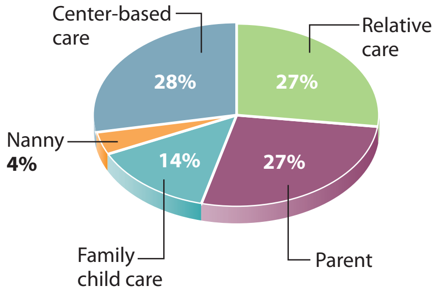


FIGURE **6.11**

PRIMARY CARE ARRANGEMENTS IN THE UNITED STATES FOR CHILDREN UNDER 5 YEARS OF AGE WITH EMPLOYED MOTHERS

Child-care quality makes a difference. What constitutes a high-quality child-care program for infants? In high-quality child care (Clarke-Stewart & Miner, 2008, p. 273):

> Caregivers encourage the children to be actively engaged in a variety of activities, have frequent, positive interactions that include smiling, touching, holding, and speaking at the child's eye level, respond properly to the child's questions or requests, and encourage children to talk about their experiences, feelings, and ideas.

High-quality child care also involves providing children with a safe environment, access to age-appropriate toys and participation in age-appropriate activities, and a low caregiver-child ratio that allows caregivers to spend considerable time with children on an individual basis.

Children are more likely to experience poor-quality child care if they come from families with few resources (psychological, social, and economic) (Cabrera, Hutchens, & Peters, 2006). Many researchers have examined the role of poverty

We have all the knowledge necessary to provide absolutely first-rate child care in the United States. What is missing is the commitment and the will.

—Edward Zigler

Contemporary Developmental Psychologist, Yale University

connecting with careers

Wanda Mitchell, Child-Care Director

Wanda Mitchell is the Center Director at the Hattie Daniels Day Care Center in Wilson, North Carolina. Her responsibilities include directing the operation of the center, which involves creating and maintaining an environment in which young children can learn effectively, and for ensuring that the center meets state licensing requirements. Wanda obtained her undergraduate degree from North Carolina A & T University, majoring in Child Development. Prior to her current position, she had been an education coordinator for Head Start and an instructor at Wilson Technical Community College. Describing her work, Wanda says, "I really enjoy working in my field. This is my passion. After graduating from college, my goal was to advance in my field."

For more information about what early education educators do, see page 46 in the Careers in Life-Span Development appendix.

Wanda Mitchell, child-care director, working with some of the children at her center.

in the quality of child care (Giannarelli, Sonenstein, & Stagner, 2006). One study found that extensive child care was harmful to low-income children only when the care was of low quality (Votruba-Drzal, Coley, & Chase-Lansdale, 2004). Even if the child was in child care more than 45 hours a week, high-quality care was linked with fewer internalizing problems (anxiety, for example) and externalizing problems (aggressive and destructive behaviors, for example). A recent study revealed that children from low-income families benefited in terms of school readiness and language development when their parents selected higher-quality child care (McCartney & others, 2007).

To read about one individual who provides quality child care to individuals from impoverished backgrounds, see *Connecting With Careers*. Do children in low-income families usually get quality care at day care? To find that out, as well other information on the effects of child care, read *Connecting Through Research*.

What are some strategies parents can follow in regard to child care? Child-care expert Kathleen McCartney (2003, p. 4) offered this advice:

- *Recognize that the quality of your parenting is a key factor in your child's development.*
- *Monitor your child's development.* "Parents should observe for themselves whether their children seem to be having behavior problems." They need to talk with their child-care providers and pediatricians about their child's behavior.
- *Take some time to find the best child care*. Observe different child-care facilities and be certain that you like what you see. "Quality child care costs money, and not all parents can afford the child care they want. However, state subsidies, and other programs like Head Start, are available for families in need."

connecting through research

How Does the Quality and Quantity of Child Care Affect Children?

In 1991, the National Institute of Child Health and Human Development (NICHD) began a comprehensive, longitudinal study of child-care experiences. Data were collected on a diverse sample of almost 1,400 children and their families at 10 locations across the United States over a period of seven years. Researchers used multiple methods (trained observers, interviews, questionnaires, and testing) and they measured many facets of children's development, including physical health, cognitive development, and socioemotional development. Following are some of the results of what is now referred to as the NICHD Study of Early Child Care and Youth Development or NICHD SECCYD (NICHD Early Child Care Network, 2001, 2002, 2003, 2004, 2005).

- *Patterns of use.* Many families placed their infants in child care very soon after the child's birth, and there was considerable instability in the child-care arrangements. By 4 months of age, nearly three-fourths of the infants had entered some form of nonmaternal child care. Almost half of the infants were cared for by a relative when they first entered care; only 12 percent were enrolled in child-care centers. Socioeconomic factors were linked to the amount and type of care. For example, mothers with higher incomes and families that were more dependent on the mother's income placed their infants in child care at an earlier age. Mothers who believed that maternal employment has positive effects on children were more likely than other mothers to place their infant in nonmaternal care for more hours. Low-income families were more likely than more affluent families to use child care, but infants from low-income families who were in child care averaged as many hours as other income groups. In the preschool years, mothers who were single, those with more education, and families with higher incomes used more hours of center care than other families. Minority families and mothers with less education used more hours of care by relatives.
- *Quality of care.* Evaluations of quality of care were based on such characteristics as group size, child-adult ratio, physical environment, caregiver characteristics (such as formal education, specialized training, and child-care experience), and caregiver behavior (such as sensitivity to children). An alarming conclusion is that a majority of the child care in the first three years of life was of unacceptable low quality. Positive caregiving by nonparents in child-care settings was infrequent—only 12 percent of the children studied experienced positive nonparental child care (such as positive talk, lack of detachment and flat affect, and language stimulation)! Further, infants from low-income families experienced lower quality of child care than infants from higher-income families. When quality of caregivers' care was high, children performed better on cognitive and language tasks, were more cooperative with their mothers during play, showed more positive and skilled interaction with peers, and had fewer behavior problems. Caregiver training and good child-staff ratios were linked with higher cognitive and social competence when children were 54 months of age. Using data collected as part of the NICHD early child care longitudinal study, a recent analysis indicated that higher-quality early child care, especially at 27 months of age, was linked to children's higher vocabulary scores in the fifth grade (Belsky & others, 2007).

  Higher-quality child care was also related to higher-quality mother-child interaction among the families that used nonmaternal care. Further, poor-quality care was related to an increase of insecure attachment to the mother among infants who were 15 months of age, but only when the mother was low in sensitivity and responsiveness. However, child-care quality was not linked to attachment security at 36 months of age.
- *Amount of child care.* The quantity of child care predicted some child outcomes. When children spent extensive amounts of time in child care beginning in infancy, they experienced less sensitive interactions with their mother, showed more behavior problems, and had higher rates of illness (Vandell, 2004). Many of these comparisons

What are some important findings from the national longitudinal study of child care conducted by the National Institute of Child Health and Human Development?

(continued)

connecting through research

(continued)

involved children in child care for less than 30 hours a week versus those in child care for more than 45 hours a week. In general, though, when children spent 30 hours or more per week in child care, their development was less than optimal (Ramey, 2005).

- *Family and parenting influences.* The influence of families and parenting was not weakened by extensive child care. Parents played a significant role in helping children to regulate their emotions. Especially important parenting influences were being sensitive to children's needs, being involved with children, and cognitively stimulating them. Indeed, parental sensitivity has been the most consistent predictor of a secure attachment with child-care experience being relevant in many cases only when mothers engage in insensitive parenting (Friedman, Melhuish, & Hill, 2010; Thompson, 2009).

This study reinforces the conclusions of other researchers cited earlier in this section of the chapter—it is not the *quantity* so much as the *quality* of child care a child receives that is important. What is also significant to note is the emphasis on the positive effect families and parents can have on children's child-care experiences.

Review *Connect* Reflect

LG3 Explain how social contexts influence the infant's development.

Review

- What are some important family processes in infant development?
- How does child care influence infant development?

Connect

- In Chapter 4, you learned about a fine motor skills experiment involving 3-month-olds and grasping. What concept in this last section of this chapter relates to the use of "sticky gloves" in the experiment in Chapter 4?

Reflect *Your Own Personal Journey of Life*

- Imagine that a friend of yours is getting ready to put her baby in child care. What advice would you give to her? Do you think she should stay home with the baby? Why or why not? What type of child care would you recommend?

topical **connections**

In Chapter 8 we will discuss socioemotional development in early childhood. Babies no more, young children make considerable progress in the development of their self, their emotions, and their social interactions. In early childhood, they show increased self-understanding and understanding of others, as well as regulating their emotions. Many of the advances in young children's socioemotional developmental become possible because of the remarkable changes in their brain and cognitive development, which you will read about in Chapter 7. In early childhood, relationships and interactions with parents and peers expand their knowledge of and connections with the social world. Additionally, play becomes something they not only enjoy doing on a daily basis but also provides a wonderful context for advancing both their socioemotional and cognitive development.

looking ***forward***

reach your **learning goals**

1 Emotional and Personality Development

LG1 Discuss the development of emotions and personality in infancy.

Emotional Development

- Emotion is feeling, or affect, that occurs when a person is in a state or an interaction that is important to him or her. The broad range of emotions includes enthusiasm, joy, and love (positive emotions) and anxiety, anger, and sadness (negative emotions). Psychologists stress that emotions, especially facial expressions of emotions, have a biological foundation. Biological evolution endowed humans to be emotional, but embeddedness in culture and relationships provides diversity in emotional experiences. Emotions are the first language with which parents and infants communicate and play key roles in parent-child relationships. Infants display a number of emotions early in their development, although researchers debate the onset and sequence of these emotions. Lewis distinguishes between primary emotions and self-conscious emotions. Crying is the most important mechanism newborns have for communicating with their world. Babies have at least three types of cries—basic, anger, and pain cries. Controversy swirls about whether babies should be soothed when they cry, although increasingly experts recommend immediately responding in a caring way in the first year. Social smiling occurs as early as 2 months of age. Two fears that infants develop are stranger anxiety and separation from a caregiver (which is reflected in separation protest). As infants develop, it is important for them to engage in emotional regulation.

Temperament

- Temperament involves individual differences in behavioral styles, emotions, and characteristic ways of responding. Chess and Thomas classified infants as (1) easy, (2) difficult, or (3) slow to warm up. Kagan proposed that inhibition to the unfamiliar is an important temperament category. Rothbart and Bates' view of temperament emphasizes this classification: (1) extraversion/surgency, (2) negative affectivity, and (3) effortful control (self-regulation). Physiological characteristics are associated with different temperaments. Children inherit a physiology that biases them to have a particular type of temperament, but through experience they learn to modify their temperament style to some degree. Goodness of fit refers to the match between a child's temperament and the environmental demands the child must cope with. Goodness of fit can be an important aspect of a child's adjustment. Although research evidence is sketchy at this point in time, some general recommendations are that caregivers should (1) be sensitive to the individual characteristics of the child, (2) be flexible in responding to these characteristics, and (3) avoid negative labeling of the child.

Personality Development

- Erikson argued that an infant's first year is characterized by the stage of trust versus mistrust. The infant begins to develop a self-understanding called self-recognition at about 18 months of age. Independence becomes a central theme in the second year of life. Erikson stressed that the second year of life is characterized by the stage of autonomy versus shame and doubt.

2 Social Orientation/Understanding and Attachment

LG2 Describe social orientation/understanding and the development of attachment in infancy.

Social Orientation/Understanding

- Infants show a strong interest in the social world and are motivated to understand it. Infants orient to the social world early in their development. Face-to-face play with a caregiver begins to occur at about 2 to 3 months of age. Newly developed self-produced locomotion skills significantly expand the infant's ability to initiate social interchanges and explore their social world more independently. Perceiving people as engaging in intentional and goal-directed behavior is an important social cognitive accomplishment and this occurs toward the end of the first year. Social referencing increases in the second year of life.

Attachment and Its Development

- Attachment is a close emotional bond between two people. In infancy, contact comfort and trust are important in the development of attachment. Bowlby's ethological theory stresses that the caregiver and the infant are biologically predisposed to form an attachment. Attachment develops in four phases during infancy.

Individual Differences in Attachment

- Securely attached babies use the caregiver, usually the mother, as a secure base from which to explore the environment. Three types of insecure attachment are avoidant, resistant, and disorganized. Ainsworth created the Strange Situation, an observational measure of attachment. Ainsworth points out that secure attachment in the first year of life provides an important foundation for psychological development later in life. The strength of the link between early attachment and later development has varied somewhat across studies. Some critics argue that attachment theorists have not given adequate attention to genetics and temperament. Other critics stress that they have not adequately taken into account the diversity of social agents and contexts. Cultural variations in attachment have been found, but in all cultures studied to date secure attachment is the most common classification.

Caregiving Styles and Attachment

- Caregivers of secure babies are sensitive to the babies' signals and are consistently available to meet their needs. Caregivers of avoidant babies tend to be unavailable or rejecting. Caregivers of resistant babies tend to be inconsistently available to their babies and usually are not very affectionate. Caregivers of disorganized babies often neglect or physically abuse their babies.

3 Social Contexts

LG3 Explain how social contexts influence the infant's development.

The Family

- The transition to parenthood requires considerable adaptation and adjustment on the part of parents. Children socialize parents just as parents socialize children. Parent-infant synchrony and scaffolding are important aspects of reciprocal socialization. Belsky's model describes direct and indirect effects. The mother's primary role when interacting with the infant is caregiving; the father's is playful interaction.

Child Care

- More U.S. children are in child care now than at any earlier point in history. The quality of child care is uneven, and child care remains a controversial topic. Quality child care can be achieved and seems to have few adverse effects on children. In the NICHD child-care study, infants from low-income families were more likely to receive the lowest quality of care. Also, higher quality of child care was linked with fewer child problems.

key terms

emotion 179
primary emotions 180
self-conscious emotions 180
basic cry 181
anger cry 181
pain cry 181
reflexive smile 181
social smile 181
stranger anxiety 182
separation protest 182
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section **four**

> *You are troubled at seeing him spend his early years doing nothing. What! Is it nothing to be happy? Is it nothing to skip, to play, to run about all day long? Never in his life will he be so busy as now.*
>
> —JEAN JACQUES ROUSSEAU
> *Swiss-Born French Philosopher, 18th Century*

Early Childhood

In early childhood, our greatest untold poem was being only 4 years old. We skipped and ran and played all the sun long, never in our lives so busy, busy being something we had not quite grasped yet. Who knew our thoughts, which we worked up into small mythologies all our own? Our thoughts and images and drawings took wings. The blossoms of our heart, no wind could touch. Our small world widened as we discovered new refuges and new people. When we said, "I," we meant something totally unique, not to be confused with any other. Section 4 consists of two chapters: "Physical and Cognitive Development in Early Childhood" (Chapter 7) and "Socioemotional Development in Early Childhood" (Chapter 8).

chapter 7

PHYSICAL AND COGNITIVE DEVELOPMENT IN EARLY CHILDHOOD

chapter **outline**

1 Physical Changes

Learning Goal 1 Identify physical changes in early childhood.

- Body Growth and Change
- Motor Development
- Sleep
- Nutrition and Exercise
- Illness and Death

2 Cognitive Changes

Learning Goal 2 Describe three views of the cognitive changes that occur in early childhood.

- Piaget's Preoperational Stage
- Vygotsky's Theory
- Information Processing

3 Language Development

Learning Goal 3 Summarize how language develops in early childhood.

- Understanding Phonology and Morphology
- Changes in Syntax and Semantics
- Advances in Pragmatics
- Young Children's Literacy

4 Early Childhood Education

Learning Goal 4 Evaluate different approaches to early childhood education.

- Variations in Early Childhood Education
- Education for Young Children Who Are Disadvantaged
- Controversies in Early Childhood Education

The Reggio Emilia approach is an educational program for young children that was developed in the northern Italian city of Reggio Emilia. Children of single parents and children with disabilities have priority in admission; other children are admitted according to a scale of needs. Parents pay on a sliding scale based on income.

The children are encouraged to learn by investigating and exploring topics that interest them. A wide range of stimulating media and materials is available for children to use as they learn music, movement, drawing, painting, sculpting, collages, puppets and disguises, and photography, for example (Schroeder-Yu, 2008).

In this program, children often explore topics in a group, which fosters a sense of community, respect for diversity, and a collaborative approach to problem solving (Hyson, Copple, & Jones, 2006). Two co-teachers are present to serve as guides for children. The Reggio Emilia teachers consider a project as an adventure, which can start from an adult's suggestion, from a child's idea, or from an event, such as a snowfall or something else unexpected. The teachers allow children enough time to think and craft a project.

At the core of the Reggio Emilia approach is the image of children who are competent and have rights, especially the right to outstanding care and education. Parent participation is considered essential, and cooperation is a major theme in the schools. Many early childhood education experts believe the Reggio Emilia approach provides a supportive, stimulating context in which children are motivated to explore their world in a competent and confident manner.

A Reggio Emilia classroom in which young children explore topics that interest them.

topical **connections**

Physical growth in infancy is dramatic. Even though physical growth in early childhood slows, it is not difficult to distinguish young children from infants when you look at them. Most young children lose their "baby fat," and their legs and trunks become longer. In addition to what you can see with the naked eye, much development also continues below the surface in the brain. In infancy, myelination of axons in the brain paved the way for development of such functions as full visual capacity. Continued myelination in early childhood provides children with much better hand-eye coordination. In terms of cognitive development, you learned that infants make amazing progress in their attentional, memory, concept formation, and language skills. In this chapter, you will discover that these information-processing skills continue to show remarkable advances in early childhood.

looking ***back***

preview

Parents and educators who clearly understand how young children develop can play an active role in creating programs that foster their natural interest in learning, rather than stifling it. In this chapter, we will explore the physical, cognitive, and language changes that typically occur as the toddler develops into the preschooler, and then examine different approaches to early childhood education.

1 Physical Changes

LG1 Identify physical changes in early childhood.

- Body Growth and Change
- Motor Development
- Sleep
- Nutrition and Exercise
- Illness and Death

Remember from Chapter 4 that an infant's growth in the first year is rapid and follows cephalocaudal and proximodistal patterns. Improvement in fine motor skills—such as being able to turn the pages of a book one at a time—also contributes to the infant's sense of mastery in the second year. The growth rate continues to slow down in early childhood. Otherwise, we would be a species of giants.

BODY GROWTH AND CHANGE

Growth in height and weight is the obvious physical change that characterizes early childhood. Unseen changes in the brain and nervous system are no less significant, however, in preparing children for advances in cognition and language.

Height and Weight The average child grows 2½ inches in height and gains between 5 and 7 pounds a year during early childhood. As the preschool child grows older, the percentage of increase in height and weight decreases with each additional year (Darrah, Senthilselvan, & Magill-Evans, 2009). Girls are only slightly smaller and lighter than boys during these years, a difference that continues until puberty. During the preschool years, both boys and girls slim down as the trunks of their bodies lengthen. Although their heads are still somewhat large for their bodies, by the end of the preschool years most children have lost their top-heavy look. Body fat also shows a slow, steady decline during the preschool years. The chubby baby often looks much leaner by the end of early childhood. Girls have more fatty tissue than boys; boys have more muscle tissue.

Growth patterns vary individually (Hockenberry, 2010). Think back to your preschool years. This was probably the first time you noticed that some children were taller than you, some shorter; some were fatter, some thinner; some were stronger, some weaker. Much of the variation was due to heredity, but environmental experiences were also involved. A review of the height and weight of children around the world concluded that the two most important contributors to height differences are ethnic origin and nutrition (Meredith, 1978). The urban, middle-socioeconomic-status, and firstborn children were taller than rural, lower-socioeconomic-status, and later-born children. In the United States, African American children are taller than White children.

The bodies of 5-year-olds and 2-year-olds are different. Notice that the 5-year-old not only is taller and weighs more, but also has a longer trunk and legs than the 2-year-old. *Can you think of some other physical differences between 2- and 5-year-olds?*

The Brain One of the most important physical developments during early childhood is the continuing development of the brain and nervous system (Nelson, 2011). Although the brain continues to grow in early childhood, it does not grow as rapidly as in infancy. By the time children reach 3 years of age, the brain is three-quarters of its adult size. By age 6, the brain has reached about 95 percent of its adult size (Lenroot & Giedd, 2006). Thus, the brain of a 5-year-old is nearly the size it will be when the child reaches adulthood, but as we will see in later chapters, the development that occurs inside the brain continues through the remaining childhood and adolescent years (Blakemore, 2010; Romer & others, 2010).

Some of the brain's interior changes involve increases in dendritic connections as well as **myelination,** in which nerve cells are covered and insulated with a layer of fat cells (see Figure 7.1). Myelination has the effect of increasing the speed and efficiency of information traveling through the nervous system (Fair & Schlaggar, 2008). Myelination is important in the development of a number of children's abilities (Diamond, Casey, & Munakata, 2011). For example, myelination in the areas of the brain related to hand-eye coordination is not complete until about 4 years of age.

Researchers also have discovered that children's brains undergo dramatic anatomical changes between the ages of 3 and 15 (Gogtay & Thompson, 2010; Thompson & others, 2000). By repeatedly obtaining brain scans of the same children for up to four years, they have found that children's brains experience rapid, distinct spurts of growth. The amount of brain material in some areas can nearly double within as little as a year, followed by a drastic loss of tissue as unneeded cells are purged and the brain continues to reorganize itself. The scientists have revealed that the overall size of the brain does not show dramatic growth in the 3- to 15-year age range. However, what does dramatically change are local patterns within the brain. Researchers have found that in children from 3 to 6 years of age the most rapid growth takes place in the frontal lobe areas involved in planning and organizing new actions, and in maintaining attention to tasks (Diamond, Casey, & Munakata, 2011; Gogtay & Thompson, 2010).

developmental **connection**

Brain Development. In middle and late childhood, cortical thickening occurs in the frontal lobes, which may be linked to improvements in language abilities such as reading. Chapter 9, p. 279

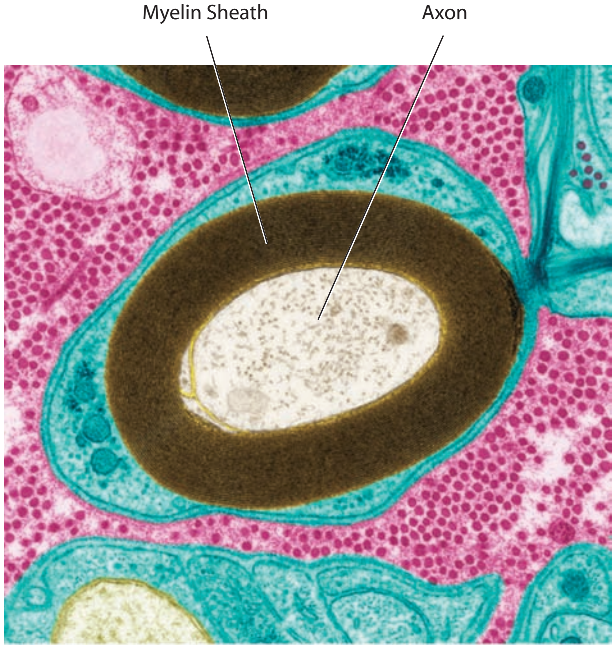


FIGURE **7.1**

A MYELINATED NERVE FIBER. The myelin sheath, shown in brown, encases the axon (white). This image was produced by an electron microscope that magnified the nerve fiber 12,000 times. *What role does myelination play in the brain's development and children's cognition?*

MOTOR DEVELOPMENT

Most preschool children are as active as they will ever be in the life span. Let's explore what this activity involves in young children's lives.

Gross Motor Skills The preschool child no longer has to make an effort simply to stay upright and to move around. As children move their legs with more confidence and carry themselves more purposefully, moving around in the environment becomes more automatic.

At 3 years of age, children enjoy simple movements, such as hopping, jumping, and running back and forth, just for the sheer delight of performing these activities. They take considerable pride in showing how they can run across a room and jump all of 6 inches. The run-and-jump will win no Olympic gold medals, but for the 3-year-old the activity is a source of considerable pride and accomplishment.

At 4 years of age, children are still enjoying the same kind of activities, but they have become more adventurous. They scramble over low jungle gyms as they display their athletic prowess.

At 5 years of age, children are even more adventuresome than when they were 4. It is not unusual for self-assured 5-year-olds to perform hair-raising stunts on practically any climbing object. Five-year-olds run hard and enjoy races with each other and their parents.

Fine Motor Skills At 3 years of age, although children have had the ability to pick up the tiniest objects between their thumb and forefinger for some time, they are still somewhat clumsy at it. Three-year-olds can build surprisingly high block towers, placing each block with intense concentration but often not in a completely straight line. When 3-year-olds play with a simple jigsaw puzzle, they are rather rough in placing the pieces. Even when they recognize the hole a piece fits into, they are not very precise in positioning the piece. They often try to force the piece into the hole or pat it vigorously.

By 4 years of age, children's fine motor coordination has improved substantially and become much more precise. Sometimes 4-year-old children have trouble building high towers with blocks because, in their desire to place each of the blocks perfectly,

myelination The process by which the nerve cells are covered and insulated with a layer of fat cells, which increases the speed at which information travels through the nervous system.

they may upset those already stacked. By age 5, children's fine motor coordination has improved further. Hand, arm, and body all move together under better command of the eye.

What characterizes young children's sleep problems?

SLEEP

Experts recommend that young children get 11 to 13 hours of sleep each night (National Sleep Foundation, 2010). Most young children sleep through the night and have one daytime nap. Not only is the amount of sleep children get important, but so is uninterrupted sleep. Also, it sometimes is difficult to get young children to go to sleep as they drag out their bedtime routine. A recent study found that bedtime resistance was associated with conduct problems or hyperactivity in children (Carvalho Bos & others, 2009).

Children can experience a number of sleep problems, including narcolepsy (extreme daytime sleepiness), insomnia (difficulty going to sleep or staying asleep), and nightmares (Nevsimalova, 2009; Sadeh, 2008). One estimate indicates that more than 40 percent of children experience a sleep problem at some point in their development (Boyle & Cropley, 2004). Researchers have found children who have sleep problems are more likely to show depression and anxiety than children who do not have sleep problems (Mehl & others, 2006). A recent study revealed that preschool children who tended to have bad dreams were characterized by a difficult temperament at 5 months of age and anxiousness at 17 months of age (Simard & others, 2008). Yet another recent study revealed that children who had sleep problems from 3 to 8 years of age were more likely to develop adolescent problems, such as early onset of drug use and depression (Wong, Brower, & Zucker, 2009). And research indicates that short sleep duration in children is linked with being overweight (Nielsen, Danielson, & Sorensen, 2010; Nixon & others, 2008). Let's now turn our attention to other aspects of children's nutrition in young children's lives.

developmental **connection**

Sleep. What sleep disorder in infancy leads to the most infant deaths and at what age is the infant most at risk for this disorder? Chapter 4, p. 118

NUTRITION AND EXERCISE

Eating habits are important aspects of development during early childhood (Schiff, 2011; Wardlaw & Smith, 2011). What children eat affects their skeletal growth, body shape, and susceptibility to disease. Exercise and physical activity also are very important aspects of young children's lives (Lumpkin, 2011).

Overweight Young Children Being overweight has become a serious health problem in early childhood (Marcdante, Kliegman, & Behrman, 2011). A recent national study revealed that 45 percent of children's meals exceed recommendations for saturated and trans fats, which can raise cholesterol levels and increase the risk of heart disease (Center for Science in the Public Interest, 2008). Also this study found that one-third of children's daily caloric intake comes from restaurants, twice the percentage consumed away from home in the 1980s. Further, 93 percent of almost 1,500 possible choices at 13 major fast-food chains exceeded 430 calories—one-third of what the National Institute of Medicine recommends that 4- to 8-year-old children consume in a day. Nearly every combination of children's meals at KFC, Taco Bell, Sonic, Jack in the Box, and Chick-fil-A were too high in calories.

Young children's eating behavior is strongly influenced by their caregivers' behavior (Black & Hurley, 2007;

Ventura, Gromis, & Lohse, 2010). Young children's eating behavior improves when caregivers eat with children on a predictable schedule, model eating healthy food, make mealtimes pleasant occasions, and engage in certain feeding styles. Distractions from television, family arguments, and competing activities should be minimized so that children can focus on eating. A sensitive/responsive caregiver feeding style, in which the caregiver is nurturant, provides clear information about what is expected, and appropriately responds to children's cues, is recommended (Black & Lozoff, 2008). Forceful and restrictive caregiver behaviors are not recommended. For example, a restrictive feeding style is linked to children being overweight.

The Centers for Disease Control and Prevention (2010) has categories for obesity, overweight, and at risk for being overweight. These categories are determined by body mass index (BMI), which is computed by a formula that takes into account height and weight. Only children and adolescents at or above the 97th percentile are classified as obese; those at or above the 95th percentile as overweight; and those at or above the 85th percentile as at risk for being overweight.

What are some trends in the eating habits and weight of young children?

The percentages of young children who are overweight or at risk for being overweight in the United States has increased dramatically in recent decades, and the percentages are likely to grow unless changes occur in children's lifestyles (Sorte, Daeschel, & Amador, 2011). A recent study revealed that from 2003 to 2006, 11 percent of U.S. 2- to 19-year-olds were obese, 16 percent were overweight, and 38 percent were at risk for being overweight (Ogden, Carroll, & Flegal, 2008). The good news from this large-scale study is that the percentages in these categories have started to level off rather than increase, as they had been doing in the last several decades.

The risk that overweight young children will continue to be overweight when they become older was documented in one study. In one study, 80 percent of the children who were at risk for being overweight at 3 years of age were also at risk for being overweight or were overweight at 12 years of age (Nader & others, 2006). Another study found that children's weight at 5 years of age was significantly linked to their weight at 9 years of age (Gardner & others, 2009). Yet another study revealed that the prevalence of being overweight remained stable from 4 to 11 years of age for children with lean parents but more than doubled across this time frame for children with obese parents (17 percent to 45 percent) (Semmler & others, 2009).

One comparison of 34 countries revealed that the United States had the second highest rate of child obesity (Janssen & others, 2005). Childhood obesity contributes to a number of health problems in young children (Oliver & others, 2010; Raghuveer, 2010). For example, physicians are now seeing type 2 (adult-onset) diabetes (a condition directly linked with obesity and a low level of fitness) in children as young as 5 years of age (Amed & others, 2010; Danne & Becker, 2007). We will have much more to consider about children's eating behavior and weight status in Chapter 9.

Exercise Routine physical activity should be a daily occurrence for young children (Dowda & others, 2009; Jago & others, 2010). Guidelines recommend that preschool children engage in two hours of physical activity per day, divided into one hour of structured activity and one hour of unstructured free play (National Association for Sport and Physical Education, 2002). The child's life should be centered around activities, not meals (Fahey, Insel, & Roth, 2011; Graham, Holt/Hale, & Parker, 2010). Following are some recent research studies that examine young children's exercise and activities:

- Observations of 3- to 5-year-old children during outdoor play at preschools revealed that the preschool children were mainly sedentary even when participating in outdoor play (Brown & others, 2009). In this study,

developmental **connection**

Health. As boys and girls reach and progress through adolescence, they exercise less. Chapter 11, p. 364

How much physical activity should preschool children engage in per day?

throughout the day the preschoolers were sedentary 89 percent of the time, engaged in light activity 8 percent of the time, and participated in moderate to vigorous physical activity only 3 percent of the time.

- Preschool children's physical activity was enhanced by family members engaging in sports together and by parents' perception that it was safe for their children to play outside (Beets & Foley, 2008).
- Incorporation of a "move and learn" physical activity curriculum increased the activity level of 3- to 5-year-old children in a half-day preschool program (Trost, Fees, & Dzewaltowski, 2008).

developmental **connection**

Community and Culture. WIC recently made changes to have food available that is more culturally appropriate. Chapter 4, p. 125

Malnutrition in Young Children From Low-Income Families

Malnutrition is a problem for many U.S. children, with approximately 11 million preschool children experiencing malnutrition that places their health at risk. One of the most common nutritional problems in early childhood is iron deficiency anemia, which results in chronic fatigue (Bartle, 2007). This problem results from the failure to eat adequate amounts of quality meats and dark green vegetables. Young children from low-income families are the most likely to develop iron deficiency anemia (Shamah & Villalpando, 2006).

In Chapter 4, we discussed the Women, Infants, and Children (WIC) program that serves approximately 7,500,000 mothers, infants, and mothers in low-income circumstances in the United States. Positive influences on young children's nutrition and health have been found for participants in WIC (Herman & others, 2008; Sekhobo & others, 2010).

ILLNESS AND DEATH

What are the greatest risks to the health of young children in the United States? How pervasive is death among young children around the world?

The United States Young children's active and exploratory nature, coupled with being unaware of danger in many instances, often puts them in situations in which they are at risk for injuries (Schwebel, 2008). In the United States, motor vehicle accidents are the leading cause of death in young children, followed by cancer and cardiovascular disease (National Vital Statistics Report, 2004) (see Figure 7.2). In addition to motor vehicle accidents, other accidental deaths in children involve drowning, falls, burns, and poisoning (Bessey & others, 2006).

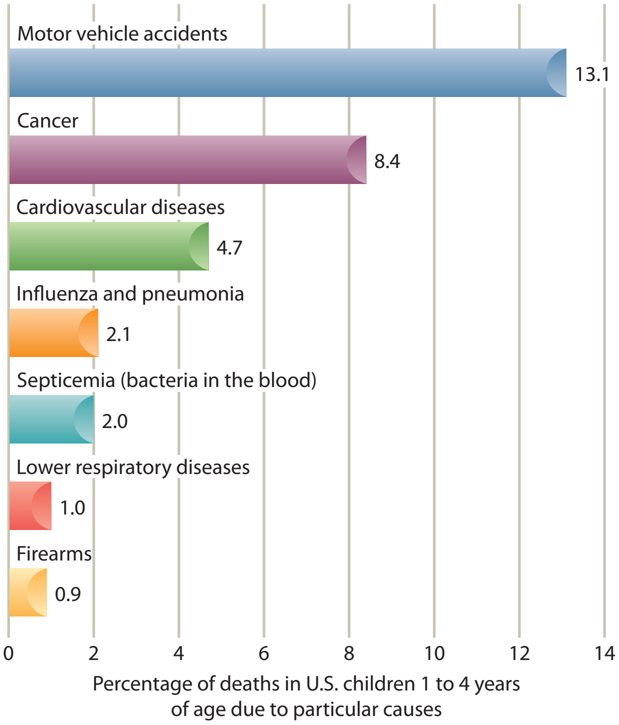


FIGURE **7.2**

MAIN CAUSES OF DEATH IN CHILDREN 1 THROUGH 4 YEARS OF AGE. These figures show the percentage of deaths in U.S. children 1 to 4 years of age due to particular causes in 2002 (National Vital Statistics Reports, 2004).

Children's safety is influenced not only by their own skills and safety behaviors but also by characteristics of their family and home, school and peers, and the community's actions (Snowdon & others, 2008; Tinsley, 2003; Trasande & others, 2010). Figure 7.3 describes steps that can be taken in each of these contexts to enhance children's safety and prevent injury (Sleet & Mercy, 2003).

Parental smoking is another major danger to children (Bolte, Fromme, & the GME Study Group, 2009). Estimates indicate that approximately 22 percent of children and adolescents in the United States are exposed to tobacco smoke in the home. An increasing number of studies reach the conclusion that children are at risk for health problems when they live in homes in which a parent smokes (Carlsen & Carlsen, 2008; Chang, 2009). Children exposed to tobacco smoke in the home are more likely to develop wheezing symptoms and asthma than children in nonsmoking homes (Herrmann, King, & Weitzman, 2008). A recent study revealed that exposure to secondhand smoke was related to young children's sleep problems, including sleep-disordered breathing (Yolton & others, 2010).

An estimated 3 million U.S. children under 6 years of age are thought to be at risk for lead poisoning (Moya, Bearer, & Etzel, 2004). The negative effects of high lead levels in children's blood include lower intelligence, lower achievement, attention deficit hyperactivity disorder, and elevated blood pressure (Bellinger, 2008; Canfield & Jusko, 2008). Children in poverty face a higher risk for lead poisoning than children living in higher socioeconomic conditions (Warniment, Tsang, & Galazka, 2010).

In addition to lead poisoning, young children from low-income families in the United States face other health problems and often receive inadequate medical care, especially when their parents do not have medical insurance (Kogan & others, 2010). Children in poverty have higher rates of accidents, death, and asthma than children from higher income families.

The State of Illness and Health of the World's Children Poverty in the United States is dwarfed by poverty in developing countries around the world. Each year UNICEF produces a report entitled *The State of the World's Children.* In one report, UNICEF (2006) concluded that the under-5 mortality rate is the result of a wide range of factors, including the nutritional health and health knowledge of mothers, the level of immunization, dehydration, availability of maternal and child health

Many children in impoverished countries die before reaching the age of 5 from dehydration and malnutrition brought about by diarrhea. *What are some of the other main causes of death in young children around the world?*

Individual

Development of social skills and ability to regulate emotions

Impulse control (such as not darting out into a street to retrieve a ball)

Frequent use of personal protection (such as bike helmets and safety seats)

Family/Home

High awareness and knowledge of child management and parenting skills

Frequent parent protective behaviors (such as use of child safety seats)

Presence of home safety equipment (such as smoke alarms and cabinet locks)

School/Peers

Promotion of home/school partnerships

Absence of playground hazards

Injury prevention and safety promotion policies and programs

Community

Availability of positive activities for children and their parents

Active surveillance of environmental hazards

Effective prevention policies in place (such as pool fencing)

FIGURE **7.3**

CHARACTERISTICS THAT ENHANCE YOUNG CHILDREN'S SAFETY. In each context of a child's life, steps can be taken to create conditions that enhance the child's safety and reduce the likelihood of injury. *How are the contexts listed in the figure related to Bronfenbrenner's theory (described in Chapter 1)?*

services, income and food availability in the family, availability of clean water and safe sanitation, and the overall safety of the child's environment.

The devastating effects on the health of young children occur in countries where poverty rates are high (UNICEF, 2010). The poor are the majority in nearly one of every five nations in the world. They often experience lives of hunger, malnutrition, illness, inadequate access to health care, unsafe water, and a lack of protection from harm (Bhutta & others, 2008).

In the last decade, there has been a dramatic increase in the number of young children who have died because of HIV/AIDS transmitted to them by their parents (UNICEF, 2010). Deaths in young children due to HIV/AIDS especially occur in countries with high rates of poverty and low levels of education (Boeving & Forsyth, 2008). For example, the uneducated are four times more likely to believe that there is no way to avoid AIDS and three times more likely to be unaware that the virus can be transmitted from mother to child (UNICEF, 2006).

Many of the deaths of young children around the world can be prevented by a reduction in poverty and improvements in nutrition, sanitation, education, and health services (UNICEF, 2006, 2010).

Review *Connect* Reflect

LG1 Identify physical changes in early childhood.

Review

- How does the body grow and change during early childhood?
- What changes take place in motor development during early childhood?
- What is the nature of sleep in young children?
- What roles do nutrition and exercise play in early childhood?
- What are some major causes of illness and death among young children in the United States and around the world?

Connect

- In this section you learned that experts recommend that children get 11 to 13 hours of sleep a night during early childhood. How does that compare to what you learned about the sleep patterns of infants in Chapter 4?

Reflect *Your Own Personal Journey of Life*

- What were your eating habits like as a young child? In what ways are they similar or different from your current eating habits? Were your early eating habits a forerunner of whether or not you have weight problems today?

2 Cognitive Changes

LG2 Describe three views of the cognitive changes that occur in early childhood.

- Piaget's Preoperational Stage
- Vygotsky's Theory
- Information Processing

The cognitive world of the preschool child is creative, free, and fanciful. Preschool children's imaginations work overtime, and their mental grasp of the world improves. Our coverage of cognitive development in early childhood focuses on three theories: Piaget's, Vygotsky's, and information processing.

preoperational stage Piaget's second stage, lasting from about 2 to 7 years of age, during which children begin to represent the world with words, images, and drawings, and symbolic thought goes beyond simple connections of sensory information and physical action; stable concepts are formed, mental reasoning emerges, egocentrism is present, and magical beliefs are constructed.

PIAGET'S PREOPERATIONAL STAGE

Remember from Chapter 5 that, during Piaget's first stage of development, the sensorimotor stage, the infant progresses in the ability to organize and coordinate sensations and perceptions with physical movements and actions. The **preoperational stage,**

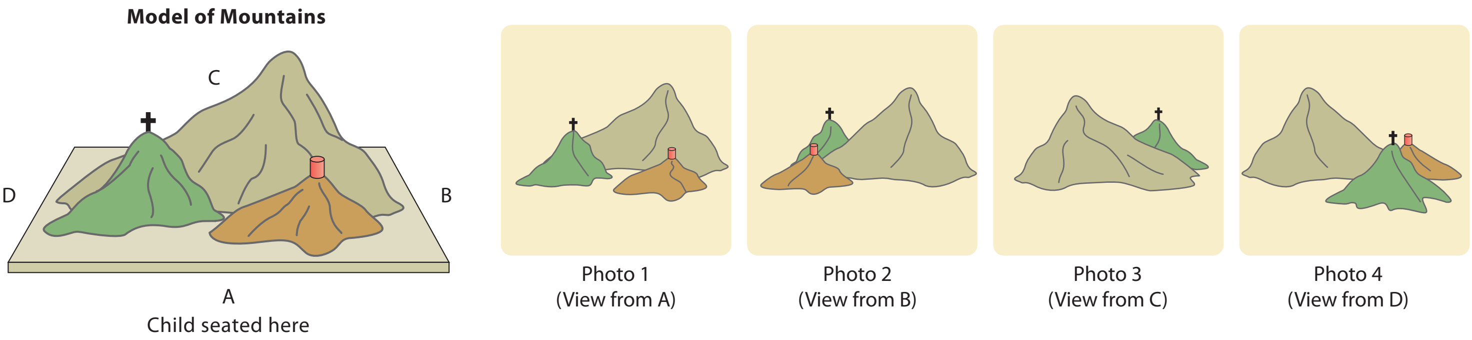


FIGURE **7.4**

THE THREE MOUNTAINS TASK. View 1 shows the child's perspective from where he or she is sitting. View 2 is an example of one of the photographs the child would be shown, along with other photographs taken from different perspectives. It shows what the mountains look like to a person sitting at spot B. When asked what a view of the mountains looks like from position B, the preoperational child selects a photograph taken from location A, the child's view at the time. A child who thinks in a preoperational way cannot take the perspective of a person sitting at another spot.

which lasts from approximately 2 to 7 years of age, is the second Piagetian stage. In this stage, children begin to represent the world with words, images, and drawings. They form stable concepts and begin to reason. At the same time, the young child's cognitive world is dominated by egocentrism and magical beliefs.

Because Piaget called this stage "preoperational," it might sound like an unimportant waiting period. Not so. However, the label *preoperational* emphasizes that the child does not yet perform **operations,** which are reversible mental actions; they allow children to do mentally what before they could do only physically. Adding and subtracting numbers mentally are examples of operations. *Preoperational thought* is the beginning of the ability to reconstruct in thought what has been established in behavior. It can be divided into two substages: the symbolic function substage and the intuitive thought substage.

The Symbolic Function Substage

The **symbolic function substage** is the first substage of preoperational thought, occurring roughly between the ages of 2 and 4. In this substage, the young child gains the ability to mentally represent an object that is not present. This ability vastly expands the child's mental world (Carlson & Zelazo, 2008). Young children use scribble designs to represent people, houses, cars, clouds, and so on; they begin to use language and engage in pretend play. However, although young children make distinct progress during this substage, their thought still has important limitations, two of which are egocentrism and animism.

Egocentrism is the inability to distinguish between one's own perspective and someone else's perspective. Piaget and Barbel Inhelder (1969) initially studied young children's egocentrism by devising the three mountains task (see Figure 7.4). The child walks around the model of the mountains and becomes familiar with what the mountains look like from different perspectives, and she can see that there are different objects on the mountains. The child is then seated on one side of the table on which the mountains are placed. The experimenter moves a doll to different locations around the table, at each location asking the child to select from a series of photos the one photo that most accurately reflects the view that the doll is seeing. Children in the preoperational stage often pick their own view rather than the doll's view. Preschool children frequently show the ability to take another's perspective on some tasks but not others.

Animism, another limitation of preoperational thought, is the belief that inanimate objects have lifelike qualities and are capable of action. A young child might show animism by saying, "That tree pushed the leaf off, and it fell down," or "The sidewalk made me mad; it made me fall down." A young child who uses animism fails to distinguish the appropriate occasions for using human and nonhuman perspectives.

Possibly because young children are not very concerned about reality, their drawings are fanciful and inventive. Suns are blue, skies are yellow, and cars float on clouds in their symbolic, imaginative world. One 3½-year-old looked at a scribble he had just drawn and described it as a pelican kissing a seal (see Figure 7.5a). The symbolism is simple but strong, like abstractions found in some modern art. Twentieth-century Spanish artist Pablo Picasso commented, "I used to draw like

developmental **connection**

Cognitive Theory. Object permanence is an important accomplishment in the sensorimotor stage. Chapter 5, p. 153

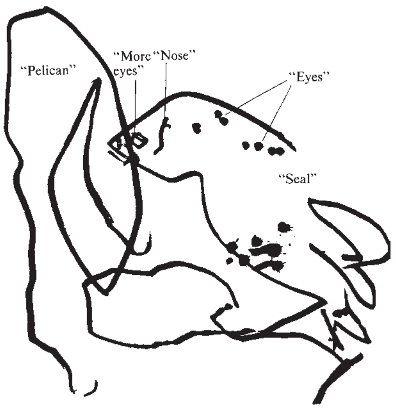
operations In Piaget's theory, these are reversible mental actions that allow children to do mentally what they formerly did physically.

symbolic function substage Piaget's first substage of preoperational thought, in which the child gains the ability to mentally represent an object that is not present (between about 2 and 4 years of age).

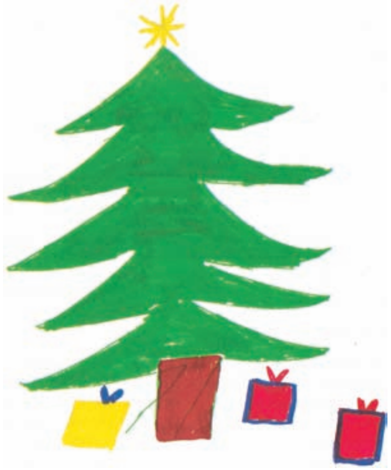
egocentrism The inability to distinguish between one's own perspective and someone else's (salient feature of the first substage of preoperational thought).

animism The belief that inanimate objects have lifelike qualities and are capable of action.

Raphael but it has taken me a lifetime to draw like young children." In the elementary school years, a child's drawings become more realistic, neat, and precise (see Figure 7.5b) (Winner, 1986).



(a)

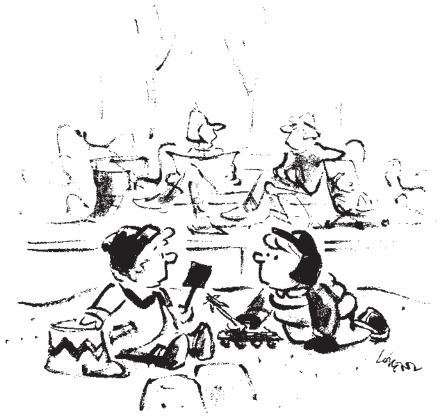


(b)

FIGURE **7.5**

THE SYMBOLIC DRAWINGS OF YOUNG CHILDREN. (*a*) A $3\frac{1}{2}$-year-old's symbolic drawing. Halfway into his drawing, the $3\frac{1}{2}$-year-old artist said it was a "pelican kissing a seal." (*b*) This 11-year-old's drawing is neater and more realistic but also less inventive.

The Intuitive Thought Substage The **intuitive thought substage** is the second substage of preoperational thought, occurring between approximately 4 and 7 years of age. In this substage, children begin to use primitive reasoning and want to know the answers to all sorts of questions. Consider 4-year-old Tommy, who is at the beginning of the intuitive thought substage. Although he is starting to develop his own ideas about the world he lives in, his ideas are still simple, and he is not very good at thinking things out. He has difficulty understanding events that he knows are taking place but that he cannot see. His fantasized thoughts bear little resemblance to reality. He cannot yet answer the question "What if?" in any reliable way. For example, he has only a vague idea of what would happen if a car were to hit him. He also has difficulty negotiating traffic because he cannot do the mental calculations necessary to estimate whether an approaching car will hit him when he crosses the road.



"I still don't have all the answers, but I'm beginning to ask the right questions."

© Lee Lorenz/The New Yorker Collection/www.cartoon.bank.

By the age of 5, children have just about exhausted the adults around them with "why" questions. The child's questions signal the emergence of interest in reasoning and in figuring out why things are the way they are. Following are some samples of the questions children ask during the questioning period of 4 to 6 years of age (Elkind, 1976): "What makes you grow up?" "Who was the mother when everybody was a baby?" "Why do leaves fall?" "Why does the sun shine?" Piaget called this substage *intuitive* because young children seem so sure about their knowledge and understanding yet are unaware of how they know what they know. That is, they know something but know it without the use of rational thinking.

Centration and the Limits of Preoperational Thought One limitation of preoperational thought is **centration,** a centering of attention on one characteristic to the exclusion of all others. Centration is most clearly evidenced in young children's lack of **conservation,** the awareness that altering an object's or a substance's appearance does not change its basic properties. For example, to adults, it is obvious that a certain amount of liquid stays the same, regardless of a container's shape. But this is not at all obvious to young children. Instead, they are struck by the height of the liquid in the container; they focus on that characteristic to the exclusion of others.

The situation that Piaget devised to study conservation is his most famous task. In the conservation task, children are presented with two identical beakers, each filled to the same level with liquid (see Figure 7.6). They are asked if these beakers have the same amount of liquid, and they usually say yes. Then the liquid from one beaker is poured into a third beaker, which is taller and thinner than the first two. The children are then asked if the amount of liquid in the tall, thin beaker is equal to that which remains in one of the original beakers. Children who are less than 7 or 8 years old usually say no and justify their answers in terms of the differing height or width of the beakers. Older children usually answer yes and justify their answers appropriately ("If you poured the water back, the amount would still be the same").

In Piaget's theory, failing the conservation-of-liquid task is a sign that children are at the preoperational stage of cognitive development. The failure demonstrates

intuitive thought substage Piaget's second substage of preoperational thought, in which children begin to use primitive reasoning and want to know the answers to all sorts of questions (between 4 and 7 years of age).

centration The focusing of attention on one characteristic to the exclusion of all others.

conservation In Piaget's theory, awareness that altering an object's or a substance's appearance does not change its basic properties.

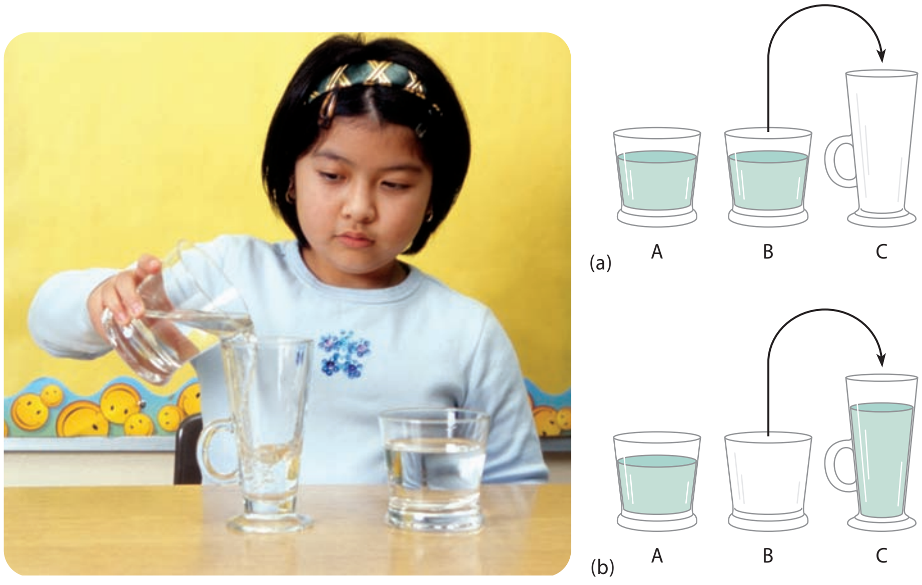


FIGURE **7.6**

PIAGET'S CONSERVATION TASK. The beaker test is a well-known Piagetian test to determine whether a child can think operationally—that is, can mentally reverse actions and show conservation of the substance. (*a*) Two identical beakers are presented to the child. Then the experimenter pours the liquid from B into C, which is taller and thinner than A or B. (*b*) The child is asked if these beakers (A and C) have the same amount of liquid. The preoperational child says "no." When asked to point to the beaker that has more liquid, the preoperational child points to the tall, thin beaker.

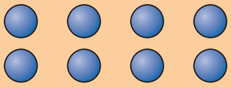
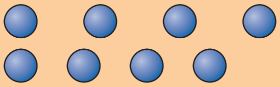
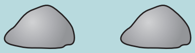
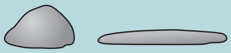
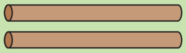
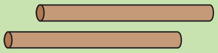
not only centration but also an inability to mentally reverse actions. For example, in the conservation of matter example shown in Figure 7.7, preoperational children say that the longer shape has more clay because they assume that "longer is more." Preoperational children cannot mentally reverse the clay-rolling process to see that the amount of clay is the same in both the shorter ball shape and the longer stick shape.

In addition to failing to conserve volume, preoperational children also fail to conserve number, matter, length, and area. However, children often vary in their performance on different conservation tasks. Thus, a child might be able to conserve volume but not number.

Some developmentalists disagree with Piaget's estimate of when children's conservation skills emerge. For example, Rochel Gelman (1969) showed that when the child's attention to relevant aspects of the conservation task is improved, the child is more likely to conserve. Gelman has also demonstrated that attentional training on one dimension, such as number, improves the preschool child's performance on another dimension, such as mass. Thus, Gelman argues that conservation appears earlier than Piaget thought and that attention is especially important in explaining conservation.

FIGURE **7.7**

SOME DIMENSIONS OF CONSERVATION: NUMBER, MATTER, AND LENGTH. *What characteristics of preoperational thought do children demonstrate when they fail these conservation tasks?*

Type of Conservation	Initial Presentation	Manipulation	Preoperational Child's Answer
Number	 Two identical rows of objects are shown to the child, who agrees they have the same number.	 One row is lengthened and the child is asked whether one row now has more objects.	Yes, the longer row.
Matter	 Two identical balls of clay are shown to the child. The child agrees that they are equal.	 The experimenter changes the shape of one of the balls and asks the child whether they still contain equal amounts of clay.	No, the longer one has more.
Length	 Two sticks are aligned in front of the child. The child agrees that they are the same length.	 The experimenter moves one stick to the right, then asks the child if they are equal in length.	No, the one on the top is longer.

VYGOTSKY'S THEORY

Piaget's theory is a major developmental theory. Another developmental theory that focuses on children's cognition is Vygotsky's theory. Like Piaget, Vygotsky (1962) emphasized that children actively construct their knowledge and understanding. In Piaget's theory, children develop ways of thinking and understanding by their actions and interactions with the physical world. In Vygotsky's theory, children are more often described as social creatures than in Piaget's theory. They develop their ways of thinking and understanding primarily through social interaction. Their cognitive development depends on the tools provided by society, and their minds are shaped by the cultural context in which they live (Gredler, 2008; Holzman, 2009).

We briefly discussed Vygotsky's theory in Chapter 1. Here we take a closer look at his ideas about how children learn and his view of the role of language in cognitive development.

The Zone of Proximal Development Vygotsky's belief in the importance of social influences, especially instruction, on children's cognitive development is reflected in his concept of the zone of proximal development. **Zone of proximal development (ZPD)** is Vygotsky's term for the range of tasks that are too difficult for the child to master alone but that can be learned with guidance and assistance of adults or more-skilled children. Thus, the lower limit of the ZPD is the level of skill reached by the child working independently. The upper limit is the level of additional responsibility the child can accept with the assistance of an able instructor (see Figure 7.8). The ZPD captures the child's cognitive skills that are in the process of maturing and can be accomplished only with the assistance of a more skilled person (Alvarez & del Rio, 2007). Vygotsky (1962) called these the "buds" or "flowers" of development, to distinguish them from the "fruits" of development, which the child already can accomplish independently.

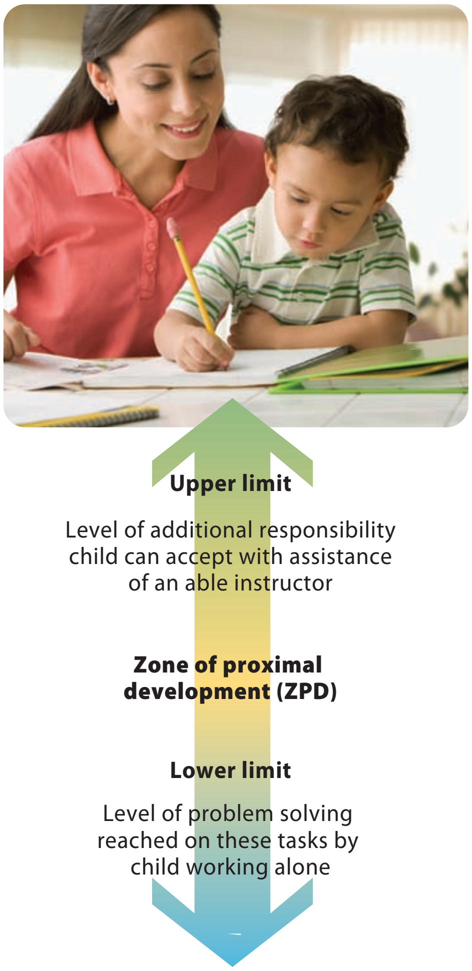

Upper limit
Level of additional responsibility child can accept with assistance of an able instructor
Zone of proximal development (ZPD)
Lower limit
Level of problem solving reached on these tasks by child working alone

FIGURE **7.8**

VYGOTSKY'S ZONE OF PROXIMAL DEVELOPMENT. Vygotsky's zone of proximal development has a lower limit and an upper limit. Tasks in the ZPD are too difficult for the child to perform alone. They require assistance from an adult or a more-skilled child. As children experience the verbal instruction or demonstration, they organize the information in their existing mental structures, so they can eventually perform the skill or task alone.

Scaffolding Closely linked to the idea of the ZPD is the concept of scaffolding. *Scaffolding* means changing the level of support. Over the course of a teaching session, a more-skilled person (a teacher or advanced peer) adjusts the amount of guidance to fit the child's current performance (Daniels, 2007). When the student is learning a new task, the skilled person may use direct instruction. As the student's competence increases, less guidance is given.

developmental **connection**

Parenting. Scaffolding also is an effective strategy for parents to adopt in interacting with their infants. Chapter 6, p. 197

Language and Thought The use of dialogue as a tool for scaffolding is only one example of the important role of language in a child's development. According to Vygotsky, children use speech not only to communicate socially but also to help them solve tasks. Vygotsky (1962) further believed that young children use language to plan, guide, and monitor their behavior. This use of language for self-regulation is called *private speech*. For Piaget, private speech is egocentric and immature, but for Vygotsky it is an important tool of thought during the early childhood years (John-Steiner, 2007).

Vygotsky said that language and thought initially develop independently of each other and then merge. He emphasized that all mental functions have external, or social, origins. Children must use language to communicate with others before they can focus inward on their own thoughts. Children also must communicate externally and use language for a long period of time before they can make the transition from external to internal speech. This transition period occurs between 3 and 7 years of age and involves talking to oneself. After a while, the self-talk becomes second nature to children, and they can act without verbalizing. When they gain this skill, children have internalized their egocentric speech in the form of *inner speech*, which becomes their thoughts.

Vygotsky reasoned that children who use a lot of private speech are more socially competent than those who don't. He argued that private speech represents an early transition in becoming more socially communicative. For Vygotsky, when

zone of proximal development (ZPD) Vygotsky's term for tasks too difficult for children to master alone but that can be mastered with the assistance of adults or more-skilled children.

young children talk to themselves, they are using language to govern their behavior and guide themselves. For example, a child working on a puzzle might say to herself, "Which pieces should I put together first? I'll try those green ones first. Now I need some blue ones. No, that blue one doesn't fit there. I'll try it over here."

Piaget maintained that self-talk is egocentric and reflects immaturity. However, researchers have found support for Vygotsky's view that private speech plays a positive role in children's development (Winsler, Carlton, & Barry, 2000). Researchers have found that children use private speech more when tasks are difficult, after they have made errors, and when they are not sure how to proceed (Berk, 1994). They also have revealed that children who use private speech are more attentive and improve their performance more than children who do not use private speech (Berk & Spuhl, 1995).

Lev Vygotsky (1896–1934), shown here with his daughter, reasoned that children's cognitive development is advanced through social interaction with more-skilled individuals embedded in a sociocultural backdrop. *How is Vygotsky's theory different from Piaget's?*

Teaching Strategies Vygotsky's theory has been embraced by many teachers and has been successfully applied to education (Daniels, 2007; Holzman, 2009). Here are some ways Vygotsky's theory can be incorporated in classrooms:

1. *Assess the child's ZPD.* Like Piaget, Vygotsky did not recommend formal, standardized tests as the best way to assess children's learning. Rather, Vygotsky argued that assessment should focus on determining the child's zone of proximal development. The skilled helper presents the child with tasks of varying difficulty to determine the best level at which to begin instruction.
2. *Use the child's ZPD in teaching.* Teaching should begin toward the zone's upper limit, so that the child can reach the goal with help and move to a higher level of skill and knowledge. Offer just enough assistance. You might ask, "What can I do to help you?" Or simply observe the child's intentions and attempts and provide support when it is needed. When the child hesitates, offer encouragement. And encourage the child to practice the skill. You may watch and appreciate the child's practice or offer support when the child forgets what to do.
3. *Use more-skilled peers as teachers.* Remember that it is not just adults who are important in helping children learn. Children also benefit from the support and guidance of more-skilled children.
4. *Place instruction in a meaningful context.* Educators today are moving away from abstract presentations of material; instead, they provide students with opportunities to experience learning in real-world settings. For example, rather than just memorizing math formulas, students work on math problems with real-world implications.
5. *Transform the classroom with Vygotskian ideas.* What does a Vygotskian classroom look like? The Kamehameha Elementary Education Program (KEEP) in Hawaii is based on Vygotsky's theory (Tharp, 1994). The ZPD is the key element of instruction in this program. Children might read a story and then interpret its meaning. Many of the learning activities take place in small groups. All children spend at least 20 minutes each morning in a setting called "Center One." In this context, scaffolding is used to improve children's literary skills. The instructor asks questions, responds to students' queries, and builds on the ideas that students generate.

Connecting Development to Life further explores the implications of Vygotsky's theory for children's education.

Evaluating Vygotsky's Theory Even though their theories were proposed about the same time, most of the world learned about Vygotsky's theory later than they learned about Piaget's theory. Thus, Vygotsky's theory has not yet been evaluated as thoroughly. However, Vygotsky's view of the importance of sociocultural influences on children's development fits with the current belief that it is important to evaluate the contextual factors in learning (Holzman, 2009).

How can Vygotsky's ideas be applied to educating children?

connecting development to life

Tools of the Mind

Tools of the Mind is an early childhood education curriculum that emphasizes children's development of self-regulation and the cognitive foundations of literacy. The curriculum was created by Elena Bodrova and Deborah Leong (2007) and has been implemented in more than 200 classrooms. Most of the children in the Tools of the Mind programs are at risk because of their living circumstances, which in many instances involve poverty and other difficult conditions such as being homeless and having parents with drug problems.

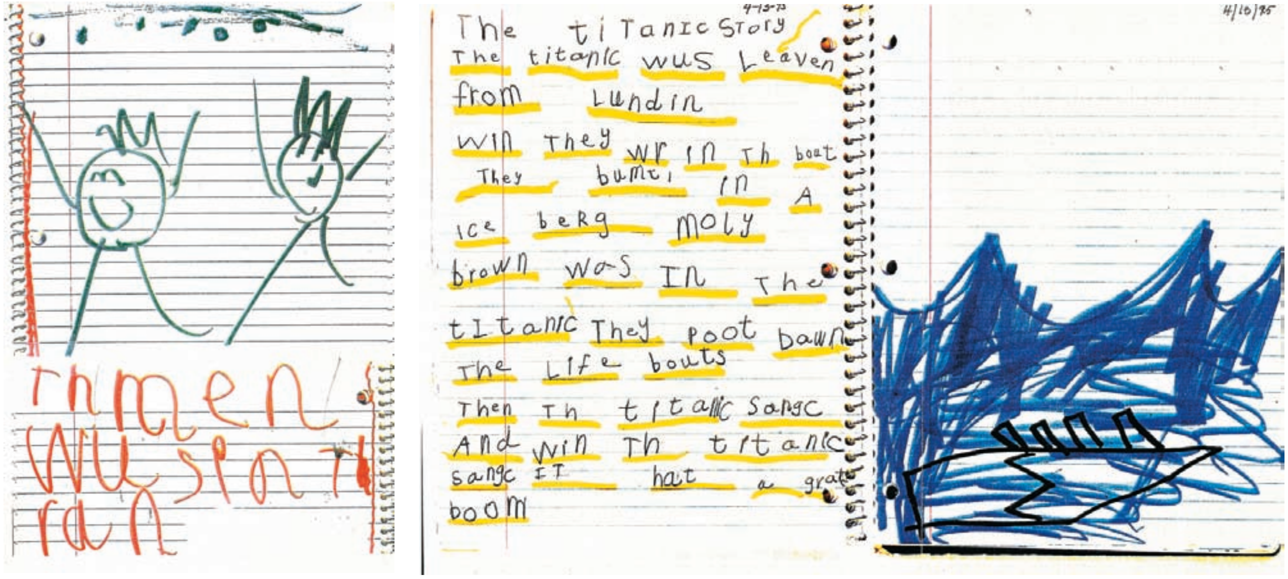
Tools of the Mind is grounded in Vygotsky's (1962) theory with special attention given to cultural tools and developing self-regulation, the zone of proximal development, scaffolding, private speech, shared activity, and play as important activity. In a Tools of the Mind classroom, dramatic play has a central role. Teachers guide children in creating themes that are based on the children's interests, such as treasure hunt, store, hospital, and restaurant. Teachers also incorporate field trips, visitor presentations, videos, and books in the development of children's play. They help children develop a play plan, which increases the maturity of their play. Play plans describe what the children expect to do in the play period, including the imaginary context, roles, and props to be used. The play plans increase the quality of their play and self-regulation.

Scaffolding writing is another important theme in the Tools of the Mind classroom. Teachers guide children in planning their own message by drawing a line to stand for each word the child says. Children then repeat the message, pointing to each line as they say the word. Then, the child writes on the lines, trying to represent each word with some letters or symbols. Figure 7.9 shows how the scaffolding writing process improved a 5-year-old child's writing over the course of two months.

Research assessments of children's writing in Tools of the Mind classrooms revealed that they have more advanced writing skills than children in other early childhood programs (Bodrova & Leong, 2007) (see Figure 7.9). For example, they write more complex messages, use more words, spell more accurately, show better letter recognition, and have a better understanding of the concept of a sentence.

A recent study assessed the effects of the Tools of the Mind curriculum on at-risk preschool children (Diamond & others, 2007). The results indicated that the Tools of the Mind curriculum improved the self-regulatory and cognitive control skills (such as resisting distractions and temptations) of the at-risk children. Other research on the Tools of the Mind curriculum also has found that it improves young children's cognitive skills (Barnett & others, 2006; Saifer, 2007).

How does the Reggio Emilia approach to education that you read about in the story that opened this chapter compare to the Tools of the Mind approach described here?



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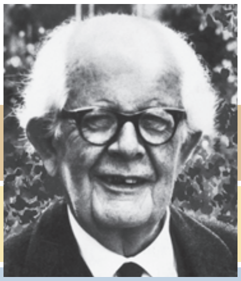
(*a*) Five-year-old Aaron's independent journal writing prior to using the scaffolded writing technique.

(*b*) Aaron's journal two months after using the scaffolded writing technique.

FIGURE **7.9**

WRITING PROGRESS OF A 5-YEAR-OLD BOY OVER TWO MONTHS USING THE SCAFFOLDING WRITING PROCESS IN TOOLS OF THE MIND



	Vygotsky	Piaget
Sociocultural Context	Strong emphasis	Little emphasis
Constructivism	Social constructivist	Cognitive constructivist
Stages	No general stages of development proposed	Strong emphasis on stages (sensorimotor, preoperational, concrete operational, and formal operational)
Key Processes	Zone of proximal development, language, dialogue, tools of the culture	Schema, assimilation, accommodation, operations, conservation, classification
Role of Language	A major role; language plays a powerful role in shaping thought	Language has a minimal role; cognition primarily directs language
View on Education	Education plays a central role, helping children learn the tools of the culture	Education merely refines the child's cognitive skills that have already emerged
Teaching Implications	Teacher is a facilitator and guide, not a director; establish many opportunities for children to learn with the teacher and more-skilled peers	Also views teacher as a facilitator and guide, not a director; provide support for children to explore their world and discover knowledge

FIGURE **7.10**

COMPARISON OF VYGOTSKY'S AND PIAGET'S THEORIES

We already have discussed several comparisons of Vygotsky's and Piaget's theories, such as Vygotsky's emphasis on the importance of inner speech in development and Piaget's view that such speech is immature. Although both theories are constructivist, Vygotsky's takes a **social constructivist approach,** which emphasizes the social contexts of learning and the construction of knowledge through social interaction.

In moving from Piaget to Vygotsky, the conceptual shift is one from the individual to collaboration, social interaction, and sociocultural activity (Halford, 2008). The endpoint of cognitive development for Piaget is formal operational thought. For Vygotsky, the endpoint can differ depending on which skills are considered to be the most important in a particular culture. For Piaget, children construct knowledge by transforming, organizing, and reorganizing previous knowledge. For Vygotsky, children construct knowledge through social interaction (Rogoff & others, 2007). The implication of Piaget's theory for teaching is that children need support to explore their world and discover knowledge. The main implication of Vygotsky's theory for teaching is that students need many opportunities to learn with the teacher and more-skilled peers. In both Piaget's and Vygotsky's theories, teachers serve as facilitators and guides, rather than as directors and molders of learning. Figure 7.10 compares Vygotsky's and Piaget's theories.

Criticisms of Vygotsky's theory also have surfaced (Karpov, 2006). Some critics point out that Vygotsky was not specific enough about age-related changes (Gauvain, 2008; Gauvain & Parke, 2010). Another criticism is that Vygotsky did not adequately describe how changes in socioemotional capabilities contribute to cognitive development (Gauvain, 2008). Yet another criticism is that he overemphasized the role of language in thinking. Also, his emphasis on collaboration and guidance has potential pitfalls. Might facilitators be too helpful in some cases, as when a parent becomes too overbearing and controlling? Further, some children might become lazy and expect help when they might have done something on their own.

INFORMATION PROCESSING

Piaget's and Vygotsky's theories provided important ideas about how young children think and how their thinking changes. More recently, the information-processing approach has generated research that illuminates how children process information during the preschool years (Galotti, 2010). What are the limitations and advances

social constructivist approach An approach that emphasizes the social contexts of learning and that knowledge is mutually built and constructed. Vygotsky's theory reflects this approach.

What are some advances in children's attention in early childhood?

in the young child's ability to pay attention to the environment, to remember, to develop strategies and solve problems, and to understand their own mental processes and those of others?

Attention Recall that in Chapter 5 we defined *attention* as the focusing of mental resources on select information. The child's ability to pay attention improves significantly during the preschool years (Posner & Rothbart, 2007). Toddlers wander around, shift attention from one activity to another, and seem to spend little time focused on any one object or event. By comparison, the preschool child might be observed watching television for a half hour.

Young children especially make advances in two aspects of attention—executive attention and sustained attention (Rothbart & Gartstein, 2008). **Executive attention** involves action planning, allocating attention to goals, error detection and compensation, monitoring progress on tasks, and dealing with novel or difficult circumstances. **Sustained attention** is focused and extended engagement with an object, task, event, or other aspect of the environment.

Mary Rothbart and Maria Gartstein (2008, p. 332) recently described why advances in executive and sustained attention are so important in early childhood:

> The development of the . . . executive attention system supports the rapid increases in effortful control in the toddler and preschool years. Increases in attention are due, in part, to advances in comprehension and language development. As children are better able to understand their environment, this increased appreciation of their surroundings helps them to sustain attention for longer periods of time.

In at least two ways, however, the preschool child's control of attention is still deficient:

- *Salient versus relevant dimensions.* Preschool children are likely to pay attention to stimuli that stand out, or are *salient,* even when those stimuli are not relevant to solving a problem or performing a task. For example, if a flashy, attractive clown presents the directions for solving a problem, preschool children are likely to pay more attention to the clown than to the directions. After the age of 6 or 7, children attend more efficiently to the dimensions of the task that are relevant, such as the directions for solving a problem. This change reflects a shift to cognitive control of attention, so that children act less impulsively and reflect more.
- *Planfulness.* When experimenters ask children to judge whether two complex pictures are the same, preschool children tend to use a haphazard comparison strategy, not examining all of the details before making a judgment. By comparison, elementary school age children are more likely to systematically compare the details across the pictures, one detail at a time (Vurpillot, 1968) (see Figure 7.11).

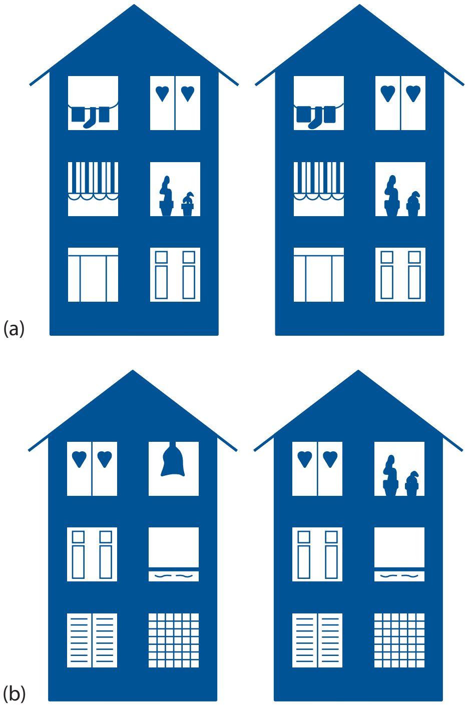


FIGURE **7.11**

THE PLANFULNESS OF ATTENTION. In one study, children were given pairs of houses to examine, like the ones shown here (Vurpillot, 1968). For three pairs of houses, what was in the windows was identical (*a*). For the other three pairs, the windows had different items in them (*b*). By filming the reflection in the children's eyes, it could be determined what they were looking at, how long they looked, and the sequence of their eye movements. Children under 6 examined only a fragmentary portion of each display and made their judgments on the basis of insufficient information. By contrast, older children scanned the windows in more detailed ways and were more accurate in their judgments of which windows were identical.

In Central European countries, such as Hungary, kindergarten children participate in exercises designed to improve their attention (Mills & Mills, 2000; Posner & Rothbart, 2007). For example, in one eye-contact exercise, the teacher sits in the center of a circle of children and each child is required to catch the teacher's eye before being permitted to leave the group. In other exercises created to improve attention, teachers have children participate in stop-go activities during which they have to listen for a specific signal, such as a drumbeat or an exact number of rhythmic beats, before stopping the activity.

Computer exercises recently have been developed to improve children's attention (Jaeggi, Berman, & Jonides, 2009; Tang & Posner, 2009). For example, one study revealed that five days of computer exercises that involved learning how to use a joystick, working memory, and the resolution of conflict improved the attention of 4- to 6-year-old children (Rueda & others, 2005).

The ability of preschool children to control and sustain their attention is related to school readiness (Posner & Rothbart, 2007). For example, a study of more than

1,000 children revealed that their ability to sustain their attention at 54 months of age was linked to their school readiness (which included achievement and language skills) (NICHD Early Child Care Research Network, 2005). And in a recent study children whose parents and teachers rated them higher on a scale of having attention problems at 54 months of age had a lower level of social skills in peer relations in the first and third grades than their counterparts who were rated lower on the attention problems scale at 54 months of age (NICHD Early Child Care Research Network, 2009).

Memory *Memory*—the retention of information over time—is a central process in children's cognitive development. In Chapter 5, we saw that most of an infant's memories are fragile and, for the most part, short-lived—except for the memory of perceptual-motor actions, which can be substantial (Mandler, 2004). Thus, we saw that to understand the infant's capacity to remember we need to distinguish *implicit memory* from *explicit memory.* Explicit memory itself, however, comes in many forms. One distinction occurs between relatively permanent or *long-term memory* and short-term memory.

Short-Term Memory In **short-term memory,** individuals retain information for up to 30 seconds if there is no rehearsal of the information. Using rehearsal (repeating information after it has been presented), we can keep information in short-term memory for a much longer period. One method of assessing short-term memory is the memory-span task. You hear a short list of stimuli—usually digits—presented at a rapid pace (one per second, for example). Then you are asked to repeat the digits.

Research with the memory-span task suggests that short-term memory increases during early childhood. For example, in one investigation memory span increased from about 2 digits in 2- to 3-year-old children to about 5 digits in 7-year-old children, yet between 7 and 13 years of age memory span increased only by 1½ digits (Dempster, 1981) (see Figure 7.12). Keep in mind, though, that memory span varies from one individual to another.

Why does memory span change with age? Rehearsal of information is important; older children rehearse the digits more than younger children do. Speed—especially the speed with which memory items can be identified—and efficiency of processing information are important, too (Schneider, 2004).

The speed-of-processing explanation highlights a key point in the information-processing perspective: The speed with which a child processes information is an important aspect of the child's cognitive abilities, and there is abundant evidence that the speed with which many cognitive tasks are completed improves dramatically across the childhood years (Kail, 2007).

How Accurate Are Young Children's Long-Term Memories? While the toddlers' short-term memory span increases during the early childhood years, their memory also becomes more accurate. Young children can remember a great deal of information if they are given appropriate cues and prompts. Increasingly, young children are even being allowed to testify in court, especially if they are the only witnesses to abuse, a crime, and so forth. Several factors can influence the accuracy of a young child's memory (Bruck & Ceci, 1999):

- *There are age differences in children's susceptibility to suggestion.* Preschoolers are the most suggestible age group in comparison with older children and adults (Lehman & others, 2010; Pipe, 2008). For example, preschool children are more susceptible to believing misleading or incorrect information given after an event (Ghetti & Alexander, 2004). Despite these age differences, there is still concern about the reaction of older children when they are subjected to suggestive interviews (Ceci & others, 2007).
- *There are individual differences in susceptibility.* Some preschoolers are highly resistant to interviewers' suggestions, whereas others immediately succumb to the slightest suggestion. A recent study revealed that preschool children's

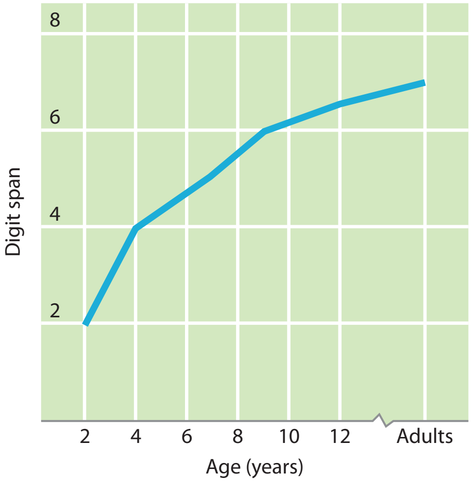


FIGURE **7.12**

DEVELOPMENTAL CHANGES IN MEMORY SPAN. In one study, from 2 years of age to 7 years of age children's memory span increased about 3 digits to 5 digits (Dempster, 1981). Between 7 and 13 years of age, memory span had increased on average only another $1\frac{1}{2}$ digits, to 7 digits. *What factors might contribute to the increase in memory span during childhood?*

executive attention Involves action planning, allocating attention to goals, error detection and compensation, monitoring progress on tasks, and dealing with novel or difficult circumstances.

sustained attention Focused and extended engagement with an object, task, event, or other aspect of the environment.

short-term memory The memory component in which individuals retain information for up to 30 seconds, assuming there is no rehearsal of the information.

ability to produce a high-quality narrative was linked to their resistance to suggestion (Kulkofsky & Klemfuss, 2008).

- *Interviewing techniques can produce substantial distortions in children's reports about highly salient events.* Children are suggestible not just about peripheral details but also about the central aspects of an event (Bruck, Ceci, & Hembrooke, 1998). In some cases, children's false reports can be tinged with sexual connotations. In laboratory studies, young children have made false claims about "silly events" that involved body contact (such as "Did the nurse lick your knee?" or "Did she blow in your ear?"). A significant number of preschool children have falsely reported that someone touched their private parts, kissed them, and hugged them, when these events clearly did not happen in the research. Nonetheless, young children are capable of recalling much that is relevant about an event (Fivush, 1993). When young children do accurately recall information about an event, the interviewer often has a neutral tone, there is limited use of misleading questions, and there is an absence of any motivation for the child to make a false report (Bruck & Ceci, 1999).

Four-year-old Jennifer Royal was the only eyewitness to one of her playmates' being shot to death. She was allowed to testify in open court and the clarity of her statements helped to convict the gunman. *What are some issues involved in whether young children should be allowed to testify in court?*

In sum, whether a young child's eyewitness testimony is accurate or not may depend on a number of factors such as the type, number, and intensity of the suggestive techniques the child has experienced. It appears that the reliability of young children's reports has as much to do with the skills and motivation of the interviewer as with any natural limitations on young children's memory (Ceci & others, 2007).

Strategies and Problem Solving In Chapter 1, we discussed that information-processing theory emphasizes the importance of using good strategies. **Strategies** consist of deliberate mental activities to improve the processing of information. For example, rehearsing information and organizing it are two typical strategies that older children and adults use to remember more effectively. For the most part, young children do not use rehearsal and organization to remember (Miller & Seier, 1994).

During early childhood, the relatively stimulus-driven toddler is transformed into a child capable of flexible, goal-directed problem solving (Zelazo & Müller, 2004). For example, 3- to 4-year-olds cannot understand that a single stimulus can be described in incompatible ways from two different perspectives (Perner & others, 2002). Consider a problem in which children must sort stimuli using the rule of *color.* In the course of the color sorting, a child may describe a red rabbit as "a *red one*" to solve the problem. However, in a subsequent task, the child may need to discover a rule that describes the rabbit as just "a *rabbit*" to solve the problem. If 3- to 4-year-olds fail to understand that it is possible to provide multiple descriptions of the same stimulus, they persist in describing the stimulus as "a red rabbit." Researchers have found that at about 4 years of age, children acquire the concept of perspectives, which allows them to appreciate that a single stimulus can be described in two different ways (Frye, 1999).

Some developmental psychologists use their training in areas such as cognitive development to pursue careers in applied areas. To read about the work of Helen Hadani, an individual who followed this path, see *Connecting With Careers*.

The Child's Theory of Mind Even young children are curious about the nature of the human mind (Gelman, 2009). They have a **theory of mind,** which refers to awareness of one's own mental processes and the mental processes of others. Studies of theory of mind view the child as "a thinker who is trying to explain, predict, and understand people's thoughts, feelings, and utterances" (Harris, 2006, p. 847).

Developmental Changes Children's theory of mind changes as they develop through childhood (Gelman, 2009; Lagattuta, Nucci, & Bosacki, 2010). Some changes occur quite early in development, as we see next.

From 18 months to 3 years of age, children begin to understand three mental states:

- *Perceptions.* By 2 years of age, a child recognizes that another person will see what's in front of her own eyes instead of what's in front of the child's eyes

strategies Deliberate mental activities to improve the processing of information.

theory of mind The awareness of one's own mental processes and the mental processes of others.

connecting with careers

Helen Hadani, Developmental Psychologist, Toy Designer, and LANGO Regional Director

Helen Hadani obtained a Ph.D. from Stanford University in developmental psychology. As a graduate student at Stanford, she worked part-time for Hasbro toys, testing its children's software on preschoolers. Her first job after graduate school was with Zowie Intertainment, which was subsequently bought by LEGO. In her work as a toy designer, Helen conducted experiments and focus groups at different stages of a toy's development, as well as the age-appropriateness of a toy. In Helen's words, "Even in a toy's most primitive stage of development, . . . you see children's creativity in responding to challenges, their satisfaction when a problem is solved or simply their delight in having fun" (Schlegel, 2000, p. 50).

More recently, she began working for LANGO, a company established on the premise that every American child should learn a foreign language. LANGO uses music, games, and art to help children learn a second language. Helen is currently a regional director for LANGO.

Lango
Foreign Languages for Kids

Helen Hadani, a developmental psychologist, with some of the toys and materials for guiding children in learning a second language.

(Lempers, Flavell, & Flavell, 1977), and by 3 years of age, the child realizes that looking leads to knowing what's inside a container (Pratt & Bryant, 1990).

- *Emotions.* The child can distinguish between positive (for example, happy) and negative (sad, for example) emotions. A child might say, "Tommy feels bad."
- *Desires.* All humans have some sort of desires. But when do children begin to recognize that someone else's desires may differ from their own? Toddlers recognize that if people want something, they will try to get it. For instance, a child might say, "I want my mommy."

Two- to three-year-olds understand the way that desires are related to actions and to simple emotions. For example, they understand that people will search for what they want and that if they obtain it, they are likely to feel happy, but if they don't, they will keep searching for it and are likely to feel sad or angry (Wellman & Woolley, 1990). Children also refer to desires earlier and more frequently than they refer to cognitive states such as thinking and knowing (Bartsch & Wellman, 1995).

One of the landmark developments in understanding others' desires is recognizing that someone else may have different desires from one's own (Doherty, 2008). Eighteen-month-olds understand that their own food preferences may not match the preferences of others—they will give an adult the food to which she says "Yummy!" even if the food is something that the infants detest (Repacholi & Gopnik, 1997). As they get older, they can verbalize that they themselves do not like something but an adult might (Flavell, & others, 1992).

Between the ages of 3 to 5, children come to understand that the mind can represent objects and events accurately or inaccurately. The realization that people can have *false beliefs*—beliefs that are not true—develops in a majority of children by the time they are 5 years old (Wellman, Cross, & Watson, 2001) (see Figure 7.13).

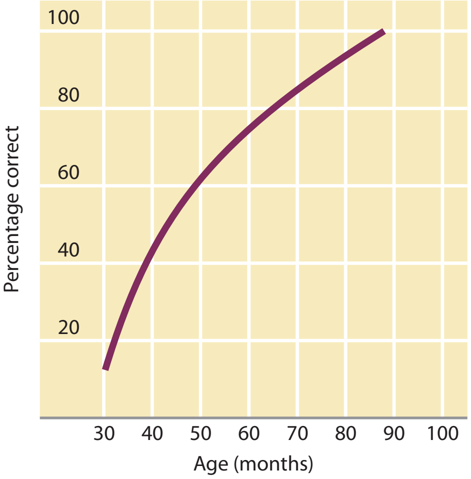


FIGURE **7.13**

DEVELOPMENTAL CHANGES IN FALSE-BELIEF PERFORMANCE. False-belief performance—the child's understanding that a person has a false belief that contradicts reality—dramatically increases from 2½ years of age through the middle of the elementary school years. In a summary of the results of many studies, 2½-year-olds gave incorrect responses about 80 percent of the time (Wellman, Cross, & Watson, 2001). At 3 years, 8 months, they were correct about 50 percent of the time, and after that, gave increasingly correct responses.

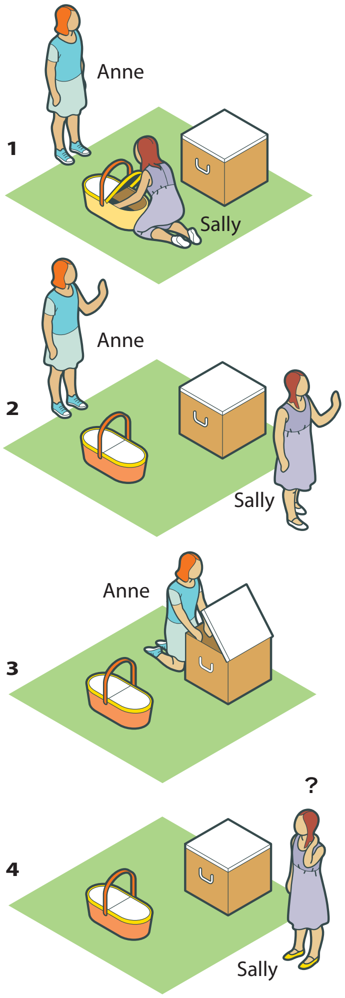


FIGURE **7.14**

THE SALLY AND ANNE FALSE-BELIEF TASK. In the false-belief task, the skit above in which Sally has a basket and Anne has a box is shown to children. Sally places a toy in her basket and then leaves. While Sally is gone and can't watch, Anne removes the toy from Sally's basket and places it in her box. Sally then comes back and the children are asked where they think Sally will look for her toy. Children are said to "pass" the false-belief task if they understand that Sally looks in her basket first before realizing the toy isn't there.

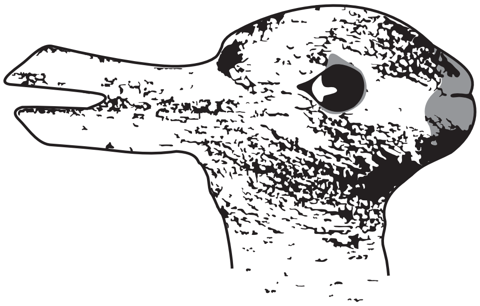


FIGURE **7.15**

AMBIGUOUS LINE DRAWING

This point is often described as a pivotal one in understanding the mind—recognizing that beliefs are not just mapped directly into the mind from the surrounding world, but that different people can also have different, and sometimes incorrect, beliefs (Gelman, 2009). In a classic false-belief task, young children were shown a Band-Aids box and asked what was inside (Jenkins & Astington, 1996). To the children's surprise, the box actually contained pencils. When asked what a child who had never seen the box would think was inside, 3-year-olds typically responded, "Pencils." However, the 4- and 5-year-olds, grinning at the anticipation of the false beliefs of other children who had not seen what was inside the box, were more likely to say "Band-Aids."

In a similar task, children are told a story about Sally and Anne: Sally places a toy in a basket and then leaves the room (see Figure 7.14). In her absence, Anne takes the toy from the basket and places it in a box. Children are asked where Sally will look for the toy when she returns. The major finding is that 3-year-olds tend to fail false-belief tasks, saying that Sally will look in the box (even though Sally could not know that the toy has moved to this new location). Four-year-olds and older children tend to pass the task, correctly saying that Sally will have a "false belief"—she will think the object is in the basket, even though that belief is now false. The conclusion from these studies is that children younger than 4 years old do not understand that it is possible to have a false belief.

However, there are many reasons to question the focus on this one supposedly pivotal moment in the development of a theory of mind. For example, the false-belief task is a complicated one that involves a number of factors such as the characters in the story and all of their individual actions (Bloom & German, 2000).

It is only beyond the preschool years—at approximately 5 to 7 years of age—that children have a deepening appreciation of the mind itself rather than just an understanding of mental states. For example, they begin to recognize that people's behaviors do not necessarily reflect their thoughts and feelings (Flavell, Green, & Flavell, 1993). Not until middle and late childhood do children see the mind as an active constructor of knowledge or processing center (Flavell, Green, & Flavell, 1998) and move from understanding that beliefs can be false to realizing that the same event can be open to multiple interpretations (Carpendale & Chandler, 1996). For example, in one study, children saw an ambiguous line drawing (for example, a drawing that could be seen as either a duck or a rabbit); one puppet told the child she believed the drawing was a duck while another puppet told the child he believed the drawing was a rabbit (see Figure 7.15). Before the age of 7, children said that there was one right answer, and it was not okay for both puppets to have different opinions.

Although most research on children's theory of mind focuses on children around or before their preschool years, at 7 years of age and beyond there are important developments in the ability to understand the beliefs and thoughts of others. Although understanding that people may have different interpretations is important, it is also necessary to recognize that some interpretations and beliefs may still be evaluated on the basis of the merits of arguments and evidence (Kuhn, Cheney, & Weinstock, 2000). In early adolescence, children begin to understand that people can have ambivalent feelings (Flavell & Miller, 1998). They start to recognize that the same person can feel both happy and sad about the same event. They also engage in more recursive thinking: thinking about what other people are thinking about.

Individual Differences As in other developmental research, there are individual differences in when children reach certain milestones in their theory of mind (Pellicano, 2010). For example, children who talk with their parents about feelings frequently as 2-year-olds show better performance on theory of mind tasks (Ruffman, Slade, & Crowe, 2002), as do children who frequently engage in pretend play (Harris, 2000).

connecting through research

How Does Theory of Mind Differ in Children With Autism?

Approximately 1 in 150 children is estimated to have some sort of autism spectrum disorder (National Autism Association, 2010). Autism can usually be diagnosed by the age of 3 years, and sometimes earlier. Children with autism show a number of behaviors different from children their age, including deficits in social interaction and communication as well as repetitive behaviors or interests. They often show indifference toward others, in many instances preferring to be alone and showing more interest in objects than people. It now is accepted that autism is linked to genetic and brain abnormalities (Sutcliffe, 2008).

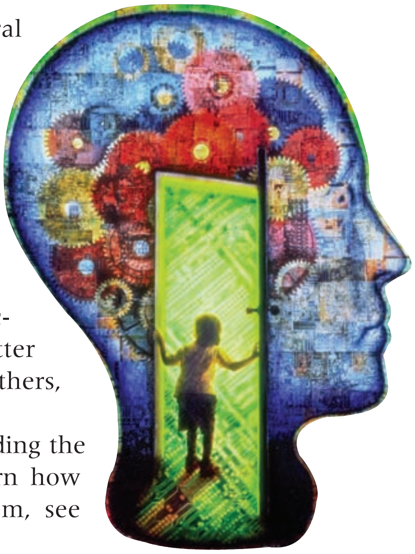
Children and adults with autism have difficulty in social interactions. These deficits are generally greater than deficits in children of the same mental age with mental retardation (Baron-Cohen, 2008). Researchers have found that children with autism have difficulty in developing a theory of mind, especially in understanding others' beliefs and emotions (Harris, 2006; Peterson & others, 2009; Williams & Happe, 2010). Although children with autism tend to do poorly when reasoning about false-belief tasks (Peterson, 2005), they can perform much better on reasoning tasks that require an understanding of physical causality.

However, it is important to consider individual variations in children with autism and particular aspects of theory of mind (Harris, 2006). Children with autism are not a homogeneous group and some have less severe social and communication problems than others. Thus, it is not surprising that children who have less severe forms of autism do better than those who have more severe forms of the disorder on some theory of mind tasks. For example, higher-functioning children with autism show reasonable progress in understanding others' desires (Harris, 2006). A further important consideration in thinking about autism and theory of mind is that children with autism might have difficulty in understanding others' beliefs and emotions not solely due to theory of mind deficits but to other aspects of cognition such as problems in focusing attention or some general intellectual impairment (Renner, Grofer Klinger, & Klinger, 2006). Some recent theories of autism suggest that weaknesses in executive functioning may relate to the problems those with autism have on theory of mind tasks. Other theories have pointed out that typically developing individuals process information by extracting the big picture, whereas those with autism process information in a very detailed, almost obsessive way. It may be that in autism, a number of different but related deficits lead to social cognitive deficits (Rajendran & Mitchell, 2007).

A young boy with autism. *What are some characteristics of autistic children? What are some deficits in autistic children's theory of mind?*

Executive function, which describes several functions (such as inhibition and planning) that are important for flexible, future-oriented behavior, also may be connected to theory of mind development (Doherty, 2008). For example, in one executive function task, children are asked to say the word "night" when they see a picture of a sun, and the word "day" when they see a picture of a moon and stars. Children who perform better at executive function tasks seem also to have a better understanding of theory of mind (Sabbagh & others, 2006).

Another individual difference in understanding the mind involves autism (Doherty, 2008). To learn how theory of mind differs in children with autism, see *Connecting Through Research*.



developmental **connection**

Conditions, Diseases, and Disorders. Boys are four times more likely to be autistic than girls are. Chapter 9, p. 285

Review *Connect* Reflect

LG2 Describe three views of the cognitive changes that occur in early childhood.

Review

- What characterizes Piaget's stage of preoperational thought?
- What does Vygotsky's theory suggest about how preschool children construct knowledge?
- What are some important ways in which information processing changes during early childhood? What characterizes children's theory of mind?

Connect

- In this section, you learned that children who frequently engage in pretend play perform better on theory of mind tasks. During which substage of Piaget's preoperational stage do children begin to engage in pretend play? What mental ability does it signify?

Reflect *Your Own Personal Journey of Life*

- If you were the parent of a 4-year-old child, would you try to train the child to develop conservation skills? Explain.

3 Language Development

LG3 Summarize how language develops in early childhood.

Understanding Phonology and Morphology

Changes in Syntax and Semantics

Advances in Pragmatics

Young Children's Literacy

Toddlers move rather quickly from producing two-word utterances to creating three-, four-, and five-word combinations. Between 2 and 3 years of age, they begin the transition from saying simple sentences that express a single proposition to saying complex sentences.

As young children learn the special features of their own language, there are extensive regularities in how they acquire that particular language (Berko Gleason, 2009). For example, all children learn the prepositions *on* and *in* before other prepositions. Children learning other languages, such as Russian or Chinese, also acquire the particular features of those languages in a consistent order.

UNDERSTANDING PHONOLOGY AND MORPHOLOGY

During the preschool years, most children gradually become more sensitive to the sounds of spoken words and become increasingly capable of producing all the sounds of their language. By the time, children are 3 years of age, they can produce all the vowel sounds and most of the consonant sounds (Menn & Stoel-Gammon, 2009).

The greatest person ever known
Is one all poets have outgrown;
The poetry, innate and untold,
Of being only four years old.

—Christopher Morley
American Novelist, 20th Century

By the time children move beyond two-word utterances, they demonstrate a knowledge of morphology rules (Tager-Flusberg & Zukowski, 2009). Children begin using the plural and possessive forms of nouns (such as *dogs* and *dog's*). They put appropriate endings on verbs (such as *-s* when the subject is third-person singular and *-ed* for the past tense). They use prepositions (such as *in* and *on*), articles (such as *a* and *the*), and various forms of the verb *to be* (such as "I *was* going to the store"). Some of the best evidence for changes in children's use of morphological rules occurs in their overgeneralization of the rules, as when a preschool child says "foots" instead of "feet," or "goed" instead of "went."

In a classic experiment that was designed to study children's knowledge of morphological rules, such as how to make a plural, Jean Berko (1958) presented preschool children and first-grade children with cards such as the one shown in

Figure 7.16. Children were asked to look at the card while the experimenter read aloud the words on the card. Then the children were asked to supply the missing word. This might sound easy, but Berko was interested in the children's ability to apply the appropriate morphological rule, in this case to say "wugs" with the *z* sound that indicates the plural.

Although the children's answers were not perfect, they were much better than chance. What makes Berko's study impressive is that most of the words were made up for the experiment. Thus, the children could not base their responses on remembering past instances of hearing the words. That they could make the plurals or past tenses of words they had never heard before was proof that they knew the morphological rules.

CHANGES IN SYNTAX AND SEMANTICS

Preschool children also learn and apply rules of syntax (Lieven, 2008; Tager-Flusberg & Zukowski, 2009). They show a growing mastery of complex rules for how words should be ordered. Consider *wh-* questions, such as "Where is Daddy going?" or "What is that boy doing?" To ask these questions properly, the child must know two important differences between *wh-* questions and affirmative statements (for instance, "Daddy is going to work" and "That boy is waiting on the school bus"). First, a *wh-*word must be added at the beginning of the sentence. Second, the auxiliary verb must be inverted—that is, exchanged with the subject of the sentence. Young children learn quite early where to put the *wh-* word, but they take much longer to learn the auxiliary-inversion rule. Thus, preschool children might ask, "Where Daddy is going?" and "What that boy is doing?"

Gains in semantics also characterize early childhood. Vocabulary development is dramatic (Pan & Uccelli, 2009). Some experts have concluded that between 18 months and 6 years of age, young children learn about one new word every waking hour (Gelman & Kalish, 2006)! By the time they enter first grade, it is estimated that children know about 14,000 words (Clark, 1993).

ADVANCES IN PRAGMATICS

Changes in pragmatics also characterize young children's language development (Bryant, 2009). A 6-year-old is simply a much better conversationalist than a 2-year-old is. What are some of the improvements in pragmatics during the preschool years?

Young children begin to engage in extended discourse (Akhtar & Herold, 2008, p. 581). For example, they learn culturally specific rules of conversation and politeness and become sensitive to the need to adapt their speech in different settings. Their developing linguistic skills and increasing ability to take the perspective of others contribute to their generation of more competent narratives.

As children get older, they become increasingly able to talk about things that are not here (grandma's house, for example) and not now (what happened to them yesterday or might happen tomorrow, for example). A preschool child can tell you what she wants for lunch tomorrow, something that would not have been possible at the two-word stage of language development.

Around 4 to 5 years of age, children learn to change their speech style to suit the situation. For example, even 4-year-old children speak differently to a 2-year-old than to a same-aged peer; they use shorter sentences with the 2-year-old. They also speak differently to an adult than to a same-aged peer, using more polite and formal language with the adult (Shatz & Gelman, 1973).

YOUNG CHILDREN'S LITERACY

The concern about the ability of U.S. children to read and write has led to a careful examination of preschool and kindergarten children's experiences, with the hope that a positive orientation toward reading and writing can be developed early in life

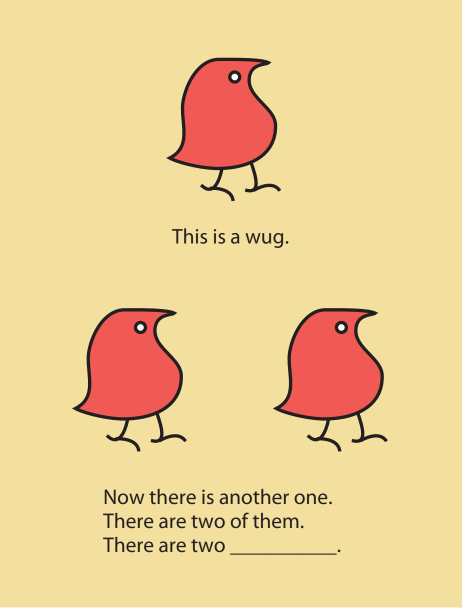

This is a wug.
Now there is another one.
There are two of them.
There are two ________.

FIGURE **7.16**

STIMULI IN BERKO'S STUDY OF YOUNG CHILDREN'S UNDERSTANDING OF MORPHOLOGICAL RULES. In Jean Berko's (1958) study, young children were presented cards, such as this one with a "wug" on it. Then the children were asked to supply the missing word; in supplying the missing word, they had to say it correctly too. "Wugs" is the correct response here.

developmental **connection**

Language. The average 2-year-old can speak about 200 words. Chapter 5, p. 168

What characterizes young children's advances in pragmatics?

(Jalongo, 2011; Wagner, 2010). Parents and teachers need to provide young children a supportive environment for them to develop literacy skills (Christie, Enz, & Vukelich, 2011; Reese, Sparks, & Leyva, 2010). Children should be active participants and be immersed in a wide range of interesting listening, talking, writing, and reading experiences (Beaty & Pratt, 2011). A recent study revealed that children whose mothers had more education had more advanced emergent literacy levels than children whose mothers who had less education (Korat, 2009). Another recent study found that literacy experiences (such as how often the child was read to), the quality of the mother's engagement with her child (such as attempts to cognitively stimulate the child) and provision of learning materials (such as age-appropriate learning materials and books) were important home literacy experiences in low-income families that were linked to the children's language development in positive ways (Rodriguez & others, 2009). Instruction should be built on what children already know about oral language, reading, and writing. Further, early precursors of literacy and academic success include language skills, phonological and syntactic knowledge, letter identification, and conceptual knowledge about print and its conventions and functions (Morrow, 2009; Otto, 2010).

The following three longitudinal studies indicate the importance of early language skills and children's school readiness:

- Phonological awareness, letter name and sound knowledge, and naming speed in kindergarten were linked to reading success in the first and second grade (Schattschneider & others, 2004).
- Children's early home environment influenced their early language skills, which in turn predicted their readiness for school (Forget-Dobois & others 2009).
- The number of letters children knew in kindergarten was highly correlated (.52) with their reading achievement in high school (Stevenson & Newman, 1986).

The advances in language that take place in early childhood lay the foundation for later development in the elementary school years, which we will discuss in Chapter 9.

Review *Connect* Reflect

LG3 Summarize how language develops in early childhood.

Review

- How do phonology and morphology change during early childhood?
- What characterizes young children's understanding of syntax and semantics in early childhood?
- What advances in pragmatics occur in early childhood?
- What are some effective ways to guide young children's literacy?

Connect

- In this section, you learned that children can sometimes overgeneralize the rules for morphology. How is this different from or similar to the concept of overextension as it relates to infants' speech (covered in Chapter 5)?

Reflect *Your Own Personal Journey of Life*

- As a parent, what would you to do to improve the likelihood that your child will enter first grade with excellent literacy skills?

4 Early Childhood Education

LG4 Evaluate different approaches to early childhood education.

Variations in Early Childhood Education

Education for Young Children Who Are Disadvantaged

Controversies in Early Childhood Education

To the teachers at a Reggio Emilia program (described in the chapter opening), preschool children are active learners, exploring the world with their peers, constructing their knowledge of the world in collaboration with their community, aided but not directed by the teachers. In many ways, the Reggio Emilia approach applies ideas consistent with the views of Piaget and Vygotsky we discussed earlier in this chapter. Our exploration of early childhood education focuses on variations in programs, education for young children who are disadvantaged, and some controversies in early childhood education.

VARIATIONS IN EARLY CHILDHOOD EDUCATION

Attending preschool is rapidly becoming the norm for U.S. children. There are many variations in the way young children are educated (Follari, 2011; Morrison, 2011; Shonkoff, 2010). The foundation of early childhood education has been the child-centered kindergarten.

What are some characteristics of the child-centered kindergarten?

The Child-Centered Kindergarten

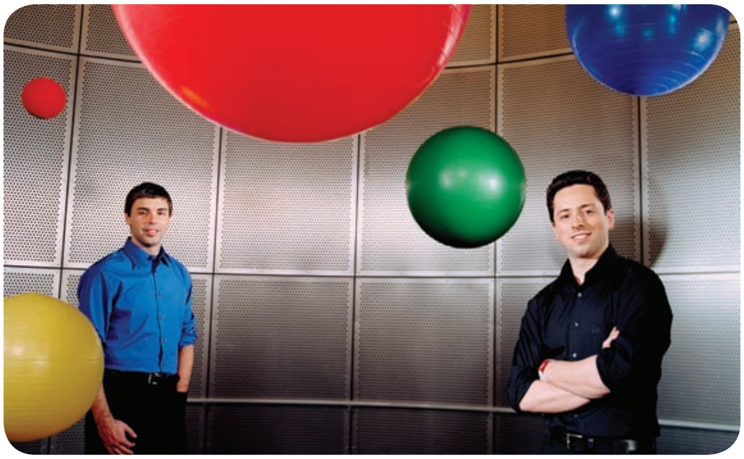
Nurturing is a key aspect of the **child-centered kindergarten,** which emphasizes the education of the whole child and concern for his or her physical, cognitive, and socioemotional development (Marion, 2010). Instruction is organized around the child's needs, interests, and learning styles. Emphasis is on the process of learning, rather than what is learned (Feeney & others, 2010; Henrick & Weissman, 2010). The child-centered kindergarten honors three principles: Each child follows a unique developmental pattern; young children learn best through firsthand experiences with people and materials; and play is extremely important in the child's total development. *Experimenting, exploring, discovering, trying out, restructuring, speaking,* and *listening* are frequent activities in excellent kindergarten programs. Such programs are closely attuned to the developmental status of 4- and 5-year-old children.

The Montessori Approach

Montessori schools are patterned after the educational philosophy of Maria Montessori (1870–1952), an Italian physician-turned-educator, who at the beginning of the 20th century crafted a revolutionary approach to young children's education. The **Montessori approach** is a philosophy of education in which children are given considerable freedom and spontaneity in choosing activities. They are allowed to move from one activity to another as they desire. The teacher acts as a facilitator rather than a director. The teacher shows the child how to perform intellectual activities, demonstrates interesting ways to explore curriculum materials, and offers help when the child requests it (Drake, 2008; Lillard, 2008). "By encouraging children to make decisions from an early age, Montessori programs seek to develop self-regulated problem solvers who can make choices and manage their time effectively" (Hyson, Copple, & Jones, 2006, p. 14). The number of Montessori schools in

child-centered kindergarten Education that involves the whole child by considering both the child's physical, cognitive, and socioemotional development and the child's needs, interests, and learning styles.

Montessori approach An educational philosophy in which children are given considerable freedom and spontaneity in choosing activities and are allowed to move from one activity to another as they desire.



Larry Page and Sergey Brin, founders of the highly successful Internet search engine, Google, recently said that their early years at Montessori schools were a major factor in their success (International Montessori Council, 2006). During an interview with Barbara Walters, they said they learned how to be self-directed and self-starters at Montessori (ABC News, 2005). They commented that Montessori experiences encouraged them to think for themselves and allowed them the freedom to develop their own interests.

the United States has expanded dramatically in recent years, from 1 school in 1959 to 355 schools in 1970 to more than 4,000 today.

Some developmentalists favor the Montessori approach, but others believe that it neglects children's socioemotional development. For example, although Montessori fosters independence and the development of cognitive skills, it deemphasizes verbal interaction between the teacher and child and peer interaction. Montessori's critics also argue that it restricts imaginative play and that its heavy reliance on self-corrective materials may not adequately allow for creativity and for a variety of learning styles.

Developmentally Appropriate and Inappropriate Education Many educators and psychologists conclude that preschool and young elementary school children learn best through active, hands-on teaching methods such as games and dramatic play. They know that children develop at varying rates and that schools need to allow for these individual differences. They also argue that schools should focus on improving children's socioemotional development, as well as their cognitive development. Educators refer to this type of schooling as **developmentally appropriate practice (DAP),** which is based on knowledge of the typical development of children within an age span (age-appropriateness), as well as the uniqueness of the child (individual-appropriateness). DAP emphasizes the importance of creating settings that encourage children to be active learners and reflect children's interests and capabilities (Bredekamp, 2011; Kostelnik, Soderman, & Whiren, 2011). Desired outcomes for DAP include thinking critically, working cooperatively, solving problems, developing self-regulatory skills, and enjoying learning. The emphasis in DAP is on the process of learning rather than its content (Barbarin & Miller, 2009; Ritchie, Maxwell, & Bredekamp, 2009). The most recent developmentally appropriate guidelines provided by the National Association for the Education of Young Children (NAEYC, 2009) are described in Figure 7.17.

Do developmentally appropriate educational practices improve young children's development? Some researchers have found that young children in developmentally appropriate classrooms are likely to have less stress, be more motivated, be more skilled socially, have better work habits, be more creative, have better language skills, and demonstrate better math skills than children in developmentally inappropriate classrooms (Hart & others, 2003). However, not all studies show significant positive benefits for developmentally appropriate education (Hyson, Copple, & Jones, 2006). Among the reasons it is difficult to generalize about research on developmentally appropriate education is that individual programs often vary, and developmentally appropriate education is an evolving concept. Recent changes in the concept have given more attention to sociocultural factors, the teacher's active involvement and implementation of systematic intentions, as well as how strong academic skills should be emphasized and how they should be taught.

What are some differences in developmentally appropriate and inappropriate practice?

EDUCATION FOR YOUNG CHILDREN WHO ARE DISADVANTAGED

For many years, U.S. children from low-income families did not receive any education before they entered the first grade. Often, they began first grade already several steps behind their classmates in their readiness to learn. In the summer of 1965, the federal government began an effort to break the cycle of poverty and poor

developmentally appropriate practice Education that focuses on the typical developmental patterns of children (age-appropriateness) and the uniqueness of each child (individual-appropriateness).

Core Considerations in Developmentally Appropriate Practice

1. **Knowledge to Consider in Making Decisions**
   In all aspects of working with children, early childhood practitioners need to consider these three areas of knowledge: 1) What is known about child development and learning, especially age-related characteristics; 2) What is known about each child as an individual; and 3) What is known about the social and cultural contexts in which children live.
2. **Challenging and Achievable Goals**
   Keeping in mind desired goals and what is known about the children as a group and individually, teachers plan experiences to promote children's learning and development.

Principles of Child Development and Learning That Inform Practice

1. All the domains of development and learning—physical, cognitive, and social—are important, and they are linked.
2. Many aspects of children's learning and development follow well-documented sequences, with later abilities, skills, and knowledge building on those already acquired.
3. Development and learning proceed at varying rates from child to child, and at uneven rates across different areas of a child's individual functioning.
4. Development and learning result from the interaction of biology and experience.
5. Early experiences have strong effects—both cumulative and delayed—on children's development and learning; optimal periods exist for certain types of development and learning.
6. Development proceeds toward greater complexity, self-regulation, and symbolic or representational capacities.
7. Children develop best when they have secure, consistent relationships with responsive adults and opportunities for positive peer relations.
8. Development and learning occur in and are influenced by multiple social and cultural contexts.
9. Always mentally active in seeking to understand the world around them, children learn in a variety of ways; a wide range of teaching strategies can be effective in guiding children's learning.
10. Play is an important context for developing self-regulation and for promoting language, cognition, and competence.
11. Development and learning advance when children are challenged to achieve at a level just beyond their current mastery and when they are given opportunities to practice newly acquired skills.
12. Children's experiences shape their motivation and approaches to learning, such as persistence, initiative, and flexibility; in turn, these characteristics influence their learning and development.

Guidelines for Developmentally Appropriate Practice

1. **Creating a Caring Community of Learners**
   Each member of the community should be valued by the others; relationships are an important context through which children learn; practitioners ensure that members of the community feel psychologically safe.
2. **Teaching to Enhance Development and Learning**
   The teacher takes responsibility for stimulating, directing, and supporting children's learning by providing the experiences that each child needs.
3. **Planning Curriculum to Achieve Important Goals**
   The curriculum is planned to help children achieve goals that are developmentally appropriate and educationally significant.
4. **Assessing Children's Development and Learning**
   In developmentally appropriate practice, assessments are linked to the program's goals for children.
5. **Establishing Reciprocal Relationships with Families**
   A positive partnership between teachers and families benefits children's learning and development.

FIGURE **7.17**

RECOMMENDATIONS BY NAEYC FOR DEVELOPMENTALLY APPROPRIATE PRACTICE IN EARLY CHILDHOOD PROGRAMS SERVING CHILDREN FROM BIRTH THROUGH AGE 8

Source: NAEYC (2009). Developmentally appropriate practice in early childhood programs serving children from birth through age 8. Washington, DC: NAEYC.

education for young children in the United States through **Project Head Start.** It is a compensatory program designed to provide children from low-income families the opportunity to acquire the skills and experiences important for success in school (Zigler & Styfco, 2010). After almost half a century, Head Start continues to be the largest federally funded program for U.S. children with almost 1 million U.S. children enrolled annually (Hagen & Lamb-Parker, 2008). In 2007, 3 percent of Head Start children were 5 years old, 51 percent were 4 years old, 36 percent were 3 years old, and 10 percent were under 3 years of age (Administration for Children & Families, 2008*)*.

Early Head Start was established in 1995 to serve children from birth to 3 years of age. In 2007, half of all new funds appropriated for Head Start programs were used for the expansion of Early Head Start. Researchers have found positive effects for Early Head Start (Hoffman & Ewen, 2007).

Project Head Start A government-funded program that is designed to provide children from low-income families with the opportunity to acquire the skills and experiences important for school success.

connecting with careers

Yolanda Garcia, Director of Children's Services/Head Start

Yolanda Garcia has been the Director of the Children's Services Department for the Santa Clara, California, County Office of Education since 1980. As director, she is responsible for managing child development programs for 2,500 3- to 5-year-old children in 127 classrooms. Her training includes two master's degrees, one in public policy and child welfare from the University of Chicago and another in education administration from San Jose State University.

Garcia has served on many national advisory committees that have resulted in improvements in the staffing of Head Start programs. Most notably, she served on the Head Start Quality Committee that recommended the development of Early Head Start and revised performance standards for Head Start programs. Garcia currently is a member of the American Academy of Science Committee on the Integration of Science and Early Childhood Education.

Yolanda Garcia, Director of Children's Services/Head Start, working with a Head Start child in Santa Clara, California.

Head Start programs are not all created equal. One estimate is that 40 percent of the 1,400 Head Start programs are of questionable quality (Zigler & Styfco, 1994). More attention needs to be given to developing consistently high-quality Head Start programs (Chambers, Cheung, & Slavin, 2006). One individual who is strongly motivated to make Head Start a valuable learning experience for young children from disadvantaged backgrounds is Yolanda Garcia. To read about her work, see *Connecting With Careers*.

Evaluations support the positive influence of quality early childhood programs on both the cognitive and social worlds of disadvantaged young children (Ryan, Fauth, & Brooks-Gunn, 2006). A recent national evaluation of Head Start revealed that the program had a positive influence on language and cognitive development (Puma & others, 2010). By the end of the first grade there were a few lasting outcomes—better vocabulary for those who went to Head Start as 4-year-olds, and better oral comprehension for those who went to Head Start as 3-year-olds. Another recent study found that when young children initially began Head Start, they were well below their more academically advantaged peers in literacy and math (Hindman & others, 2010). However, by the end of the first grade the Head Start children were on par with national averages in literacy and math.

One high-quality early childhood education program (although not a Head Start program) is the Perry Preschool program in Ypsilanti, Michigan, a two-year preschool program that includes weekly home visits from program personnel. In analyses of the long-term effects of the program, adults who had been in the Perry Preschool program were compared with a control group of adults from the same background who did not receive the enriched early childhood education (Schweinhart & others, 2005; Weikert, 1993). Those who had been in the Perry Preschool program had fewer teen pregnancies and higher high school graduation rates, and at age 40 more were in the workforce, owned their own homes, had a savings account, and had fewer arrests.

CONTROVERSIES IN EARLY CHILDHOOD EDUCATION

Two current controversies in early childhood education involve (1) what the curriculum for early childhood education should be (Hyson, 2007), and (2) whether preschool education should be universal in the United States (Zigler, Gilliam, & Jones, 2006).

My day was...
great

What is the curriculum controversy in early childhood education?

Curriculum Controversy A current controversy in early childhood education involves what the curriculum for early childhood education should be (Barbarin & Miller, 2009; Ritchie, Maxwell, & Bredekamp, 2009; Marion, 2010). On one side are those who advocate a child-centered, constructivist approach much like that emphasized by the National Association for the Education of Young Children (NAEYC), along the lines of developmentally appropriate practice. On the other side are those who advocate an academic, direct-instruction approach.

In reality, many high-quality early childhood education programs include both academic and constructivist approaches. Many education experts like Lilian Katz (1999), though, worry about academic approaches that place too much pressure on young children to achieve and don't provide any opportunities to actively construct knowledge. Competent early childhood programs also should focus on cognitive development *and* socioemotional development, not exclusively on cognitive development (NAEYC, 2009; Ritchie, Maxwell, & Bredekamp, 2009).

Universal Preschool Education Another early childhood education controversy focuses on whether preschool education should be instituted for all U.S. 4-year-old children. Edward Zigler and his colleagues (2006) recently argued that the United States should have universal preschool education. They emphasize that quality preschools prepare children for school readiness and academic success. Zigler and his colleagues (2006) cite research that shows quality preschool programs increase the likelihood that once children go to elementary and secondary school they will be less likely to be retained in a grade or drop out of school. They also point to analyses indicating that universal preschool would bring considerable cost savings on the order of billions of dollars because of a diminished need for remedial and justice services (Karoly & Bigelow, 2005).

Critics of universal preschool education argue that the gains attributed to preschool and kindergarten education are often overstated. They especially stress that research has not proven that nondisadvantaged children improve as a result of attending a preschool. Thus, the critics say it is more important to improve preschool education for young children who are disadvantaged rather than funding preschool education for all 4-year-old children. Some critics, especially homeschooling advocates, emphasize that young children should be educated by their parents, not by schools. Thus, controversy continues to characterize whether universal preschool education should be implemented.

Review *Connect* Reflect

LG4 Evaluate different approaches to early childhood education.

Review

- What are some variations in early childhood education?
- What are the main efforts to educate young children who are disadvantaged?
- What are two controversies about early childhood education?

Connect

- In Chapter 1 you learned about cross-sectional and longitudinal research designs. Which type of research design is the Perry Preschool program?

Reflect *Your Own Personal Journey of Life*

- What type of early childhood education program would you want your child to attend? Why?

topical **connections**

In the next chapter, you will read about the many advances in the socioemotional development of young children. The cognitive advances we discussed in this chapter, combined with the socioemotional experiences young children have in interacting with others, pave the way for social cognitive advances in understanding the self and others. Then, in Chapter 9 you will read about the continuing changes in children's physical and cognitive development in middle and late childhood. In terms of physical development, their motor skills will become smoother and more coordinated. The development of their brain—especially in the prefrontal cortex—provides the foundation for the development of a number of cognitive advances, including strategies and reading skills.

*looking **forward***

reach your **learning goals**

Physical and Cognitive Development in Early Childhood

1 Physical Changes

LG1 Identify physical changes in early childhood.

Body Growth and Change	• The average child grows 2½ inches in height and gains between 5 and 7 pounds a year during early childhood. Growth patterns vary individually, though. Some of the brain's interior changes in early childhood are due to myelination. From 3 to 6 years of age, the most rapid growth in the brain occurs in the frontal lobes.
Motor Development	• Gross motor skills increase dramatically during early childhood. Children become increasingly adventuresome as their gross motor skills improve. Fine motor skills also improve substantially during early childhood.
Sleep	• Experts recommend that young children get 11 to 13 hours of sleep each night. Most young children sleep through the night and have one daytime nap. Helping the young child slow down before bedtime often leads to less resistance in going to bed. Sleep problems in young children are linked to other problems, such as being overweight and being depressed. Disruptions in sleep in early childhood are related to less optimal adjustment in preschool.
Nutrition and Exercise	• Too many young children in the United States are being raised on diets that are too high in fat. The child's life should be centered on activities, not meals. Other nutritional concerns include malnutrition in early childhood and the inadequate diets of many children living in poverty. Young children are not getting nearly as much exercise as they need.
Illness and Death	• In recent decades, vaccines have virtually eradicated many diseases that once resulted in the deaths of many young children. The disorders still most likely to be fatal for young children in the United States are cancer and cardiovascular disease, but accidents are the leading cause of death in young children. A special concern is the poor health status of many young children in low-income families. There has been a dramatic increase in HIV/AIDS in young children in developing countries in the last decade.

2 Cognitive Changes

LG2 Describe three views of the cognitive changes that occur in early childhood.

Piaget's Preoperational Stage

- According to Piaget, in the preoperational stage children cannot yet perform operations, which are reversible mental actions, but they begin to represent the world with symbols, to form stable concepts, and to reason. During the symbolic function substage, which occurs between about 2 and 4 years of age, children begin to mentally represent an object that is not present, but their thought is limited by egocentrism and animism. During the intuitive thought substage, which stretches from about 4 to 7 years of age, children begin to reason and to bombard adults with questions. Thought at this substage is called intuitive because children seem so sure about their knowledge yet are unaware of how they know what they know. Centration and a lack of conservation also characterize the preoperational stage.

Vygotsky's Theory

- Vygotsky's theory represents a social constructivist approach to development. According to Vygotsky, children construct knowledge through social interaction, and they use language not only to communicate with others but also to plan, guide, and monitor their own behavior and to help them solve problems. His theory suggests that adults should assess and use the child's zone of proximal development (ZPD), which is the range of tasks that are too difficult for children to master alone but that can be learned with the guidance and assistance of adults or more-skilled children. The theory also suggests that adults and peers should teach through scaffolding, which involves changing the level of support over the course of a teaching session, with the more-skilled person adjusting guidance to fit the student's current performance level.

Information Processing

- The child's ability to attend to stimuli dramatically improves during early childhood. Advances in executive attention and sustained attention are especially important in early childhood, but the young child still attends to the salient rather than the relevant features of a task. Significant improvement in short-term memory occurs during early childhood. With good prompts, young children's long-term memories can be accurate, although young children can be led into developing false memories. Young children usually don't use strategies to remember, but they can learn rather simple, goal-directed problem solving. Young children express curiosity about the human mind, and this has been studied under the topic of theory of mind. A number of developmental changes characterize children's theory of mind, including those involved in false beliefs. Individual variations also are involved in theory of mind. For example, autistic children have difficulty in developing such a theory.

3 Language Development

LG3 Summarize how language develops in early childhood.

Understanding Phonology and Morphology

- Young children increase their grasp of language's rule systems. In terms of phonology, most young children become more sensitive to the sounds of spoken language. Berko's classic experiment demonstrated that young children understand morphological rules.

Changes in Syntax and Semantics

- Preschool children learn and apply rules of syntax and of how words should be ordered. In terms of semantics, vocabulary development increases dramatically during early childhood.

Advances in Pragmatics

- Young children's conversational skills improve, they increase their sensitivity to the needs of others in conversation, and they learn to change their speech style to suit the situation.

Young Children's Literacy

- Parents and teachers need to provide young children a supportive environment for them to develop literacy skills. Children should be active participants and be immersed in a wide range of interesting listening, talking, writing, and reading experiences.

4 Early Childhood Education

LG4 Evaluate different approaches to early childhood education.

Variations in Early Childhood Education	• The child-centered kindergarten emphasizes the education of the whole child, with particular attention to individual variation, the process of learning, and the importance of play in development. The Montessori approach allows children to choose from a range of activities while teachers serve as facilitators. Developmentally appropriate practice focuses on the typical patterns of children (age-appropriateness) and the uniqueness of each child (individual-appropriateness). Such practice contrasts with developmentally inappropriate practice, which ignores the concrete, hands-on approach to learning.
Education for Young Children Who Are Disadvantaged	• The U.S. government has tried to break the poverty cycle with programs such as Head Start. The Early Head Start program began in 1995. Model programs have been shown to have positive effects on children who live in poverty.
Controversies in Early Childhood Education	• Controversy characterizes early childhood education curricula. On the one side are the child-centered, constructivist advocates; on the other are those who advocate an instructivist, academic approach. Another controversy focuses on whether preschool education matters, especially in regard to children who are not disadvantaged.

key **terms**

myelination 211
preoperational stage 216
operations 217
symbolic function substage 217
egocentrism 217
animism 217
intuitive thought substage 218
centration 218
conservation 218
zone of proximal development (ZPD) 220
social constructivist approach 223
executive attention 225
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chapter 8

SOCIOEMOTIONAL DEVELOPMENT IN EARLY CHILDHOOD

chapter **outline**

1 Emotional and Personality Development

Learning Goal 1 Discuss emotional and personality development in early childhood.

The Self
Emotional Development
Moral Development
Gender

2 Families

Learning Goal 2 Explain how families can influence young children's development.

Parenting
Child Maltreatment
Sibling Relationships and Birth Order
The Changing Family in a Changing Society

3 Peer Relations, Play, and Television

Learning Goal 3 Describe the roles of peers, play, and television in young children's development.

Peer Relations
Play
Television

In his memoir *Burning Fence: A Western Memoir of Fatherhood,* award-winning novelist Craig Lesley describes one memory from his early childhood:

> Lifting me high above his head, my father placed me in the crotch of the Bing cherry tree growing beside my mother's parents' house in The Dalles. A little frightened at the dizzying height, I pressed my palms into the tree's rough, peeling bark. My father stood close, reassuring. I could see his olive skin, dazzling smile, and sharp-creased army uniform.
>
> "Rudell, don't let him fall." My mother watched, her arms held out halfway, as if to catch me. . . .
>
> The cherries were ripe and robins flittered through the green leaves, pecking at the Bings. Tipping my head back I could see blue sky beyond the extended branches.
>
> "That's enough. Bring him down now." My mother's arms reached out farther.
>
> Laughing, my father grabbed me under the arms, twirled me around, and plunked me into the grass. I wobbled a little. Imprinted on my palms was the pattern of the tree bark, and I brushed off the little bark pieces on my dungarees.
>
> In a moment, my grandmother gave me a small glass of lemonade. . . .
>
> This first childhood memory of my father remains etched in my mind. . . .
>
> When I grew older, I realized that my father had never lifted me into the cherry tree. After Rudell left, I never saw him until I was fifteen. My grandfather had put me in the tree. Still, the memory of my father lifting me into the tree persists. Even today, I remain half-convinced by the details, the press of bark against my palms, the taste of lemonade, the texture of my father's serge uniform. Apparently, my mind has cross-wired the photographs of my handsome father in his army uniform with the logical reality that my grandfather set me in the crotch of the tree.
>
> Why can I remember the event so vividly? I guess because I wanted so much for my father to be there. I have no easy answers. (Lesley, 2005, pp. 8–10)

Like millions of children, Lesley experienced a family torn by divorce; he would also experience abuse by a stepfather. When his father left, Lesley was an infant, but even as a preschooler, he felt his father's absence. Once he planned to win a gift for his father so that his grandmother "could take it to him and then he'd come to see me" (Lesley, 2005, p. 16). In just a few years, the infant had become a child with a complicated emotional and social life.

topical **connections**

As infants, children's socioemotional development reflects considerable progress as their caregivers (especially their parents) socialize them, and they develop more sophisticated ways of initiating social interactions with others. Development of a secure attachment is a key aspect of infant development, and the development of autonomy in the second year of life also signals an important accomplishment. As children move through infancy, it is important for caregivers to guide them in regulating their emotions. Temperament also is a central characteristic of the infant's profile and some temperament styles are more adaptive than others. Child care has become increasingly common in recent years and the quality of this care varies considerably. Parents continue to play key roles in children's development in the early childhood period, but peers begin to play more important roles as well.

looking ***back***

preview

In early childhood, children's emotional lives and personalities develop in significant ways, and their small worlds widen. In addition to the continuing influence of family relationships, peers take on a more significant role in children's development, and play fills the days of many young children's lives.

1 Emotional and Personality Development

LG1 Discuss emotional and personality development in early childhood.

- The Self
- Emotional Development
- Moral Development
- Gender

Many changes characterize young children's socioemotional development in early childhood. Their developing minds and social experiences produce remarkable advances in the development of their self, emotional maturity, moral understanding, and gender awareness.

THE SELF

We learned in Chapter 6 that during the second year of life children make considerable progress in self-recognition. In the early childhood years, young children develop in many ways that enable them to enhance their self-understanding.

Initiative Versus Guilt In Chapter 1, you read about Erik Erikson's (1968) eight developmental stages that are encountered during certain time periods in the human life span. As you learned in Chapter 6, Erikson's first two stages, trust versus mistrust, and autonomy versus shame and doubt, describe what he considers to be the main developmental tasks of infancy. Erikson's psychosocial stage associated with early childhood is *initiative versus guilt.* By now, children have become convinced that they are persons of their own; during early childhood, they begin to discover what kind of person they will become. They identify intensely with their parents, who most of the time appear to them to be powerful and beautiful, although often unreasonable, disagreeable, and sometimes even dangerous. During early childhood, children use their perceptual, motor, cognitive, and language skills to make things happen. They have a surplus of energy that permits them to forget failures quickly and to approach new areas that seem desirable—even if dangerous—with undiminished zest and some increased sense of direction. On their own *initiative,* then, children at this stage exuberantly move out into a wider social world.

The great governor of initiative is *conscience.* Their initiative and enthusiasm may bring them not only rewards but also guilt, which lowers self-esteem.

Self-Understanding and Understanding Others Recent research studies have revealed that young children are more psychologically aware—of themselves and others—than used to be thought (Carpendale & Lewis, 2011; Hughes & Ensor, 2010; Thompson & Virmani, 2010). This increased psychological awareness reflects young children's expanding psychological sophistication.

Self-Understanding In Erikson's portrait of early childhood, the young child clearly has begun to develop **self-understanding,** which is the representation of self, the substance and content of self-conceptions (Harter, 2006). Though not the whole of personal identity, self-understanding provides its rational underpinnings. Mainly through interviews, researchers have probed children's conceptions of many aspects of self-understanding.

self-understanding The child's cognitive representation of self, the substance and content of the child's self-conceptions.

What characterizes young children's self-understanding?

As we saw in Chapter 6, "Socioemotional Development in Infancy," early self-understanding involves self-recognition. In early childhood, young children think that the self can be described by many material characteristics, such as size, shape, and color. They distinguish themselves from others through many physical and material attributes. Says 4-year-old Sandra, "I'm different from Jennifer because I have brown hair and she has blond hair." Says 4-year-old Ralph, "I am different from Hank because I am taller and I am different from my sister because I have a bicycle." Physical activities are also a central component of the self in early childhood (Keller, Ford, & Meacham, 1978). For example, preschool children often describe themselves in terms of activities such as play. In sum, in early childhood, children often provide self-descriptions that involve body attributes, material possessions, and physical activities.

Although young children mainly describe themselves in terms of concrete, observable features and action tendencies, at about 4 to 5 years of age, as they hear others use psychological trait and emotion terms, they begin to include these in their own self-descriptions (Marsh, Ellis, & Craven, 2002). Thus, in a self-description, a 4-year-old might say, "I'm not scared. I'm always happy."

Young children's self-descriptions are typically unrealistically positive, as reflected in the comment of this 4-year-old who says he is always happy, which he is not (Harter, 2006). They expressed this optimism because they don't yet distinguish between their desired competence and their actual competence, tend to confuse ability and effort (thinking that differences in ability can be changed as easily as can differences in effort), don't engage in spontaneous social comparison of their abilities with those of others, and tend to compare their present abilities with what they could do at an earlier age (by which they usually look quite good). Perhaps as adults we should all be so optimistic about our abilities (Thompson, 2008).

Understanding Others Children also make advances in their understanding of others in early childhood (Carpendale & Lewis, 2011). As we saw in Chapter 7, "Physical and Cognitive Development in Early Childhood," young children's theory of mind includes understanding that other people have emotions and desires. And, at about 4 to 5 years, children not only start describing themselves in terms of psychological traits, but they also begin to perceive others in terms of psychological traits. Thus, a 4-year-old might say, "My teacher is nice."

Young children are more psychologically aware of themselves and others than used to be thought. Some children are better than others at understanding people's feelings and desires—and, to some degree, these individual differences are influenced by conversations caregivers have with young children about feelings and desires.

Something important for children to develop is an understanding that people don't always give accurate reports of their beliefs (Gee & Heyman, 2007). Researchers have found that even 4-year-olds understand that people may make statements that aren't true to obtain what they want or to avoid trouble (Lee & others, 2002). For example, one recent study revealed that 4- and 5-year-olds were increasingly skeptical of another child's claim to be sick when the children were informed that the child was motivated to avoid having to go to camp (Gee & Heyman, 2007). Another recent study found that at 3 years of age, children mistrusted people who made a single error, but it wasn't until 4 years of age that, when deciding whom to trust, children took into account the relative frequency of errors informants made (Pasquini & others, 2007).

Another important aspect of understanding others involves understanding joint commitments. A recent study revealed that 3-year-olds, but not 2-year-olds, recognized when an adult is committed and when they themselves are committed to joint activity that involves obligation to a partner (Grafenhain & others, 2009).

Both the extensive theory of mind research and the recent research on young children's social understanding underscore that young children are not as *egocentric* as Piaget envisioned (Sokol, Snjezana, & Muller 2010). Leading expert on children's socioemotional development, Ross Thompson (2009b) recently commented about how amazed he is that Piaget's concept of egocentrism has become so ingrained in people's thinking about young children given the fact that the current research on social awareness in infancy and early childhood is so dissonant with Piaget's egocentrism concept.

EMOTIONAL DEVELOPMENT

The young child's growing awareness of self is linked to the ability to feel an expanding range of emotions. Young children, like adults, experience many emotions during the course of a day. Their emotional development in early childhood allows them to try to make sense of other people's emotional reactions and to begin to control their own emotions.

A young child expressing the emotion of shame, which occurs when a child evaluates his or her actions as not living up to standards. A child experiencing shame wishes to hide or disappear. *Why is shame called a self-conscious emotion?*

Expressing Emotions Recall from Chapter 6 that even young infants experience emotions such as joy and fear, but to experience *self-conscious emotions* children must be able to refer to themselves and be aware of themselves as distinct from others (Lewis, 2007). Pride, shame, embarrassment, and guilt are examples of self-conscious emotions. Self-conscious emotions do not appear to develop until self-awareness appears around 18 months of age.

During the early childhood years, emotions such as pride and guilt become more common. They are especially influenced by parents' responses to children's behavior. For example, a young child may experience shame when a parent says, "You should feel bad about biting your sister."

Understanding Emotions Among the most important changes in emotional development in early childhood is an increased understanding of emotion. During early childhood, young children increasingly understand that certain situations are likely to evoke particular emotions, facial expressions indicate specific emotions, and emotions affect behavior, and emotions can be used to influence others' emotions (Cole & others, 2009). A recent meta-analysis revealed that emotion knowledge (such as understanding emotional cues; for example, when a young child understands that a peer feels sad about being left out of a game) was positively related to 3- to 5-year-olds' social competence (such as offering an empathic response to the child left out of a game) and negatively related to their internalizing (high level of anxiety, for example) and externalizing problems (high level of aggressive behavior, for example) (Trentacosta & Fine, 2009). A recent study also found that young children's emotion understanding was linked to their prosocial behavior (Ensor, Spencer, & Hughes, 2010).

Between 2 and 4 years of age, children considerably increase the number of terms they use to describe emotions. During this time, they are also learning about the causes and consequences of feelings (Denham, Bassett, & Wyatt, 2007).

When they are 4 to 5 years of age, children show an increased ability to reflect on emotions. They also begin to understand that the same event can elicit different feelings in different people. Moreover, they show a growing awareness that they need to manage their emotions to meet social standards. And by 5 years of age most children can accurately determine emotions that are produced by challenging circumstances and describe strategies they might call on to cope with everyday stress (Cole & others, 2009).

Regulating Emotions As we saw in Chapter 6, "Socioemotional Development in Infancy," emotion regulation is an important aspect of development (Kopp, 2011). Emotion regulation especially plays a key role in children's ability to manage the

connecting through research

Are Specific Components of Parenting Linked to Specific Emotions in Children?

In one study, Maayan Davidov and Joan Grusec (2006) found some specific outcomes for children's emotional development depending on which aspect of parenting was expressed. In the study, parents' responses to children's distress (such as responding with empathy), but not parents' warmth, was linked to children's capacity to regulate their negative emotions (such as expressing appropriate affect in response to aggression by peers); in contrast, the mother's warmth, but not her response to her child's distress, was related to children's regulation of positive emotions (such as being cheerful) (Davidov & Grusec, 2006). This study underscores an important point about parenting. Many studies take a global approach to parenting, rather than examining specific components. For example, parents' responses to a child's distress and parents' warmth are often lumped together in a broad positive parenting category. However, in the Davidov and Grusec study, parents' responses to a child's distress and parents' warmth predicted different outcomes for children.

Developmentalists also argue that in many cases distinctive parenting responses should be activated depending on the domain involved (Beaulieu & Bugental, 2007; Grusec & Davidov, 2010). For example, if a child becomes distressed, a sensitive parent soothes the child, whereas an insensitive parent might try to distract the child's attention by asking the child to play a game or become power assertive; however, when a child is angrily defiant, a more assertive response, rather than soothing, might be required by the parent.

demands and conflicts they face in interacting with others (Cole & others, 2009; Lewis, Todd, & Xu, 2011).

Emotion-Coaching and Emotion-Dismissing Parents Parents can play an important role in helping young children regulate their emotions. Depending on how they talk with their children about emotion, parents can be described as taking an *emotion-coaching* or an *emotion-dismissing* approach (Gottman, 2009). The distinction between these approaches is most evident in the way the parent deals with the child's negative emotions (anger, frustration, sadness, and so on). *Emotion-coaching parents* monitor their children's emotions, view their children's negative emotions as opportunities for teaching, assist them in labeling emotions, and coach them in how to deal effectively with emotions. In contrast, *emotion-dismissing parents* view their role as to deny, ignore, or change negative emotions. Emotion-coaching parents interact with their children in a less rejecting manner, use more scaffolding and praise, and are more nurturant than are emotion-dismissing parents (Gottman & DeClaire, 1997). Moreover, the children of emotion-coaching parents are better at soothing themselves when they get upset, more effective in regulating their negative affect, focus their attention better, and have fewer behavior problems than the children of emotion-dismissing parents. Next, we further explore links between parenting and children's emotional development in *Connecting Through Research*.

Regulation of Emotion and Peer Relations Emotions play a strong role in determining the success of a child's peer relationships (Howes, 2009). Specifically, the ability to modulate one's emotions is an important skill that benefits children in their relationships with peers. Moody and emotionally negative children are more likely to experience rejection by their peers, whereas emotionally positive children are more popular (Stocker & Dunn, 1990). A recent study revealed that 4-year-olds recognized and generated strategies for controlling their anger more than did 3-year-olds (Cole & others, 2009).

What role does emotion regulation play in peer relations?

MORAL DEVELOPMENT

Moral development involves the development of thoughts, feelings, and behaviors regarding rules and conventions about what people should do in their interactions with other people. Major developmental theories have focused on different aspects of moral development.

Moral Feelings Feelings of anxiety and guilt are central to the account of moral development provided by Freud's psychoanalytic theory (introduced in Chapter 1). According to Freud, to reduce anxiety, avoid punishment, and maintain parental affection, children identify with parents, internalizing their standards of right and wrong, and thus form the *superego,* the moral element of personality.

Freud's ideas are not backed by research, but guilt certainly can motivate moral behavior. Other emotions, however, also contribute to the child's moral development, including positive feelings. One important example is *empathy,* which is responding to another person's feelings with an emotion that echoes the other's feelings.

Infants have the capacity for some purely empathic responses, but empathy often requires the ability to discern another's inner psychological states, or what is called *perspective taking*. Learning how to identify a wide range of emotional states in others and to anticipate what kinds of action will improve another person's emotional state help to advance children's moral development.

Moral Reasoning Interest in how children think about moral issues was stimulated by Piaget (1932), who extensively observed and interviewed children from the ages of 4 through 12. Piaget watched children play marbles to learn how they used and thought about the game's rules. He also asked children about ethical issues—theft, lies, punishment, and justice, for example. Piaget concluded that children go through two distinct stages in how they think about morality.

- From about 4 to 7 years of age, children display **heteronomous morality,** the first stage of moral development in Piaget's theory. Children think of justice and rules as unchangeable properties of the world, removed from the control of people.
- From 7 to 10 years of age, children are in a transition showing some features of the first stage of moral reasoning and some stages of the second stage, autonomous morality.
- From about 10 years of age and older, children show **autonomous morality.** They become aware that rules and laws are created by people, and in judging an action they consider the actor's intentions as well as the consequences.

Because young children are heteronomous moralists, they judge the rightness or goodness of behavior by considering its consequences, not the intentions of the actor. For example, to the heteronomous moralist, breaking twelve cups accidentally is worse than breaking one cup intentionally. As children develop into moral autonomists, intentions become more important than consequences.

The heteronomous thinker also believes that rules are unchangeable and are handed down by all-powerful authorities. When Piaget suggested to young children that they use new rules in a game of marbles, they resisted. By contrast, older children—moral autonomists—accept change and recognize that rules are merely convenient conventions, subject to change.

The heteronomous thinker also believes in **immanent justice,** the concept that if a rule is broken, punishment will be meted out immediately. The young child believes that a violation is connected automatically to its punishment. Immanent justice also implies that if something unfortunate happens to someone, the person must have transgressed earlier. Older children, who are moral autonomists, recognize that punishment occurs only if someone witnesses the wrongdoing and that, even then, punishment is not inevitable.

developmental **connection**

Theories. Freud theorized that individuals go through five psychosexual stages. Chapter 1, p. 23

How is this child's moral thinking likely to be different about stealing a cookie depending on whether he is in Piaget's heteronomous or autonomous stage?

moral development Development that involves thoughts, feelings, and behaviors regarding rules and conventions about what people should do in their interactions with other people.

heteronomous morality The first stage of moral development in Piaget's theory, occurring from approximately 4 to 7 years of age. Justice and rules are conceived of as unchangeable properties of the world, removed from the control of people.

autonomous morality In Piaget's theory, displayed by older children (about 10 years of age and older). The child becomes aware that rules and laws are created by people and that in judging an action one should consider the actor's intentions as well as the consequences.

immanent justice The concept that if a rule is broken punishment will be meted out immediately.

developmental **connection**

Development. Kohlberg's theory, like Piaget's, emphasizes that peers play more important roles in children's moral development than parents do. Chapter 10, p. 322

How do these changes in moral reasoning occur? Piaget concluded that the changes come about through the mutual give-and-take of peer relations. In the peer group, where others have power and status similar to the child's, plans are negotiated and coordinated, and disagreements are reasoned about and eventually settled. Parent-child relations, in which parents have the power and children do not, are less likely to advance moral reasoning, because rules are often handed down in an authoritarian way.

Moral Behavior The behavioral and social cognitive approaches, initially described in Chapter 1, focus on moral behavior rather than moral reasoning. It holds that the processes of reinforcement, punishment, and imitation explain the development of moral behavior. When children are rewarded for behavior that is consistent with laws and social conventions, they are likely to repeat that behavior. When models who behave morally are provided, children are likely to adopt their actions. And, when children are punished for immoral behavior, those behaviors are likely to be reduced or eliminated. However, because punishment may have adverse side effects, as discussed later in this chapter, it needs to be used judiciously and cautiously.

In the moral behavior view, the situation also influences behavior. More than a half century ago, a comprehensive study of thousands of children in many situations—at home, at school, and at church, for example—found that the totally honest child was virtually nonexistent; so was the child who cheated in all situations (Hartshorne & May, 1928–1930). Behavioral and social cognitive researchers emphasize that what children do in one situation is often only weakly related to what they do in other situations. A child might cheat in class but not in a game; a child might steal a piece of candy when alone but not steal it when others are present.

developmental **connection**

Theories. What are the main themes of Bandura's social cognitive theory? Chapter 1, p. 27

Social cognitive theorists also stress that the ability to resist temptation is closely tied to the development of self-control. To achieve this self-control, children must learn to delay gratification. According to social cognitive theorists, cognitive factors are important in the child's development of self-control (Bandura, 2009, 2010a, b).

Conscience **Conscience** refers to an internal regulation of standards of right and wrong that involves an integration of all three components of moral development we have described so far—moral thought, feeling, and behavior (Kochanska & Aksan, 2007). Reflecting the presence of a conscience in young children, researchers have found that young children are aware of right and wrong, have the capacity to show empathy toward others, experience guilt, indicate discomfort following a transgression, and are sensitive to violating rules (Kochanska & Aksan, 2007; Kochanska & others, 2009).

A major interest in young children's conscience focuses on the children's relationship with their caregivers (Thompson, 2009d). Especially important in this regard is the emergence of the young children's willingness to embrace the values of their parents that flows from a positive, close relationship (Kochanska & Aksan, 2007). For example, children who are securely attached are more likely to internalize their parents' values and rules (Thompson, 2009d).

Parenting and Young Children's Moral Development In Ross Thompson's (2006, 2009c) view, young children are moral apprentices, striving to understand what is moral. Among the most important aspects of the relationship between parents and children that contribute to children's moral development are relational quality, parental discipline, proactive strategies, and conversational dialogue.

Parent-child relationships introduce children to the mutual obligations of close relationships (Kochanska & others, 2008). Parents' obligations include engaging in positive caregiving and guiding children to become competent human beings. Children's obligations include responding appropriately to parents' initiatives and maintaining a positive relationship with parents. A recent study revealed that an early mutually responsive orientation between parents and their infant and a decrease in parents' use of power assertion in disciplining a young child were

conscience An internal regulation of standards of right and wrong that involves an integration of moral thought, feeling, and behavior.

linked to an increase in the child's internalization and self-regulation (Kochanska & others, 2008).

An important parenting strategy is to proactively avert potential misbehavior by children before it takes place (Thompson, 2009c). With younger children, being proactive means using diversion, such as distracting their attention or moving them to alternative activities. With older children, being proactive may involve talking with them about values that the parents deem important.

Conversations related to moral development can benefit children whether they occur as part of a discipline encounter or outside the encounter in the everyday stream of parent-child interaction (Thompson, Meyer, & McGinley, 2006; Thompson, 2010). The conversations can be planned or spontaneous and can focus on topics such as past events (for example, a child's prior misbehavior or positive moral conduct), shared future events (for example, going somewhere that may involve a temptation and requires positive moral behavior), and immediate events (for example, talking with the child about a sibling's tantrums).

What are some aspects of relationships between parents and children that contribute to children's moral development?

GENDER

Recall from Chapter 1 that *gender* refers to the characteristics of people as males and females. **Gender identity** involves a sense of one's own gender, including knowledge, understanding, and acceptance of being male or female (Egan & Perry, 2001). One aspect of gender identity involves knowing whether you are a girl or boy, which most children can do by about 2½ years of age (Blakemore, Berenbaum, & Liben, 2009). **Gender roles** are sets of expectations that prescribe how females or males should think, act, and feel. During the preschool years, most children increasingly act in ways that match their culture's gender roles. **Gender typing** refers to acquisition of a traditional masculine or feminine role. For example, fighting is more characteristic of a traditional masculine role and crying is more characteristic of a traditional feminine role. A recent study revealed that sex-typed behavior (boys playing with cars and girls with jewelry, for example) increased during the preschool years and that children engaging in the most sex-typed behavior during the preschool years still did so at 8 years of age (Golombok & others, 2008).

How is gender influenced by biology? By children's social experiences? By cognitive factors?

Biological Influences

Biology clearly plays a role in gender development. Among the possible biological influences are chromosomes, hormones, and evolution.

Chromosomes and Hormones Biologists have learned a great deal about how sex differences develop. Recall that humans normally have 46 chromosomes arranged in pairs (see Chapter 2). The 23rd pair consists of a combination of X and Y chromosomes, usually two X chromosomes in a female and an X and a Y in a male. In the first few weeks of gestation, however, female and male embryos look alike.

Males start to differ from females when genes on the Y chromosome in the male embryo trigger the development of testes rather than ovaries; the testes secrete copious amounts of the class of hormones known as androgens. Low levels of androgens in the female embryo allow the normal development of female sex organs.

Thus, hormones play a key role in the development of sex differences. The two main classes of sex hormones, estrogens and androgens, are secreted by the *gonads* (ovaries in females, testes in males). *Estrogens,* such as estradiol, influence the development of female physical sex characteristics. *Androgens,* such as testosterone, promote the development of male physical sex characteristics. Sex hormones also can

gender identity The sense of being male or female, which most children acquire by the time they are 3 years old.

gender role A set of expectations that prescribes how females or males should think, act, and feel.

gender typing Acquisition of a traditional masculine or feminine role.

influence children's socioemotional development. A recent study revealed that higher fetal testosterone level measured from amniotic fluid was linked to increased male-typical play in 6- to 10-year-old boys and girls (Auyeung & others, 2009).

First imagine that this is a photograph of a baby girl. *What expectations would you have of her?* Then imagine that this is a photograph of a baby boy. *What expectations would you have of him?*

The Evolutionary Psychology View How might physical differences between the sexes give rise to psychological differences between males and females? Evolutionary psychology (introduced in Chapter 2) offers one answer. According to evolutionary psychology, adaptation during human evolution produced psychological differences between males and females (Buss, 2008; Cosmides, 2011). Because of their differing roles in reproduction, males and females faced differing pressures when the human species was evolving. In particular, because having multiple sexual liaisons improves the likelihood that males will pass on their genes, natural selection favored males who adopted short-term mating strategies. These are strategies that allow a male to win the competition with other males for sexual access to females. Therefore, say evolutionary psychologists, males evolved dispositions that favor violence, competition, and risk taking.

In contrast, according to evolutionary psychologists, females' contributions to the gene pool were improved when they secured resources that ensured that their offspring would survive. As a consequence, natural selection favored females who devoted effort to parenting and chose successful, ambitious mates who could provide their offspring with resources and protection.

Critics of evolutionary psychology argue that its hypotheses are backed by speculations about prehistory, not evidence, and that in any event people are not locked into behavior that was adaptive in the evolutionary past. Critics also claim that the evolutionary view pays little attention to cultural and individual variations in gender differences (Best, 2010; Matlin, 2008).

Social Influences

Many social scientists do not locate the cause of psychological gender differences in biological dispositions. Rather, they argue that these differences are due to social experiences. Explanations for how gender differences come about through experience include both social and cognitive theories.

Social Theories of Gender Three main social theories of gender have been proposed—social role theory, psychoanalytic theory, and social cognitive theory. Alice Eagly (2001, 2009; Eagly & Fischer, 2009; Eagly & Sczesny, 2009) proposed **social role theory,** which states that gender differences result from the contrasting roles of women and men. In most cultures around the world, women have less power and status than men, and they control fewer resources (UNICEF, 2010). Compared with men, women perform more domestic work, spend fewer hours in paid employment, receive lower pay, and are more thinly represented in the highest levels of organizations. In Eagly's view, as women adapted to roles with less power and less status in society, they showed more cooperative, less dominant profiles than men. Thus, the social hierarchy and division of labor are important causes of gender differences in power, assertiveness, and nurturing.

The **psychoanalytic theory of gender** stems from Freud's view that the preschool child develops a sexual attraction to the opposite-sex parent. This is the process known as the Oedipus (for boys) or Electra (for girls) complex. At 5 or 6 years of age, the child renounces this attraction because of anxious feelings. Subsequently, the child identifies with the same-sex parent, unconsciously adopting the same-sex parent's characteristics. However, developmentalists have observed that gender development does not proceed as Freud proposed. Children become gender-typed much earlier than 5 or 6 years of age, and they become masculine or feminine even when the same-sex parent is not present in the family.

The social cognitive approach discussed in Chapter 1 provides an alternative explanation of how children develop gender-typed behavior. According to the **social cognitive theory of gender,** children's gender development occurs through observing and imitating what other people say and do, and through being rewarded and

social role theory A theory that gender differences result from the contrasting roles of men and women.

psychoanalytic theory of gender A theory deriving from Freud's view that the preschool child develops a sexual attraction to the opposite-sex parent, by approximately 5 or 6 years of age renounces this attraction because of anxious feelings, and subsequently identifies with the same-sex parent, unconsciously adopting the same-sex parent's characteristics.

social cognitive theory of gender A theory that emphasizes that children's gender development occurs through the observation and imitation of gender behavior and through the rewards and punishments children experience for gender-appropriate and gender-inappropriate behavior.

punished for gender-appropriate and gender-inappropriate behavior (Bussey & Bandura, 1999). From birth onward, males and females are treated differently from one another. When infants and toddlers show gender differences, adults tend to reward them. Parents often use rewards and punishments to teach their daughters to be feminine ("Karen, you are being a good girl when you play gently with your doll") and their sons to be masculine ("Keith, a boy as big as you is not supposed to cry"). Parents, however, are only one of many sources through which children learn gender roles (Blakemore, Berenbaum, & Liben, 2009). Culture, schools, peers, the media, and other family members also provide gender role models. For example, children also learn about gender from observing other adults in the neighborhood and on television (Bugental & Grusec, 2006). As children get older, peers become increasingly important. Let's take a closer look at the influence of parents and peers.

"How is it gendered?"
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www.cartoonbank.com

Parental Influences Parents, by action and by example, influence their children's gender development (Gore, 2009). Both mothers and fathers are psychologically important to their children's gender development (Best, 2010; Grusec & Davidov, 2007). Cultures around the world, however, tend to give mothers and fathers different roles (Kagitcibasi, 2007). A recent research review provided these conclusions (Bronstein, 2006):

- *Mothers' socialization strategies.* In many cultures, mothers socialize their daughters to be more obedient and responsible than their sons. They also place more restrictions on daughters' autonomy.
- *Fathers' socialization strategies.* Fathers show more attention to sons than daughters, engage in more activities with sons, and put forth more effort to promote sons' intellectual development.

Thus, according to Bronstein (2006, pp. 269–270), "Despite an increased awareness in the United States and other Western cultures of the detrimental effects of gender stereotyping, many parents continue to foster behaviors and perceptions that are consonant with traditional gender role norms."

Peer Influences Parents provide the earliest discrimination of gender roles, but before long peers join the process of responding to and modeling masculine and feminine behavior (Blakemore, Berenbaum, & Liben, 2009). In fact, peers become so important to gender development that the playground has been called "gender school" (Luria & Herzog, 1985).

Peers extensively reward and punish gender behavior (Leaper & Friedman, 2007). For example, when children play in ways that the culture says are sex-appropriate, their peers tend to reward them. But peers often reject children who act in a manner that is considered more characteristic of the other gender (Matlin, 2008). A little girl who brings a doll to the park may find herself surrounded by new friends; a little boy might be jeered. However, there is greater pressure for boys to conform to a traditional male role than for girls to conform to a traditional female role (Fagot, Rogers, & Leinbach, 2000). For example, a preschool girl who wants to wear boys' clothing receives considerably more approval than a boy who wants to wear a dress. The very term "tomboy" implies broad social acceptance of girls' adopting traditional male behaviors.

Gender molds important aspects of peer relations (Best, 2010). It influences the composition of children's groups, the size of groups, and interactions within a group (Maccoby, 1998, 2002):

- *Gender composition of children's groups.* Around the age of 3, children already show a preference to spend time with same-sex playmates. From 4 to 12 years of age, this preference for playing in same-sex groups increases, and during the elementary school years children spend a large majority of their free time with children of their own sex (see Figure 8.1).
- *Group size.* From about 5 years of age onward, boys are more likely to associate together in larger clusters than girls are. Boys are also more likely to participate in organized group games than girls are. In one study, same-sex

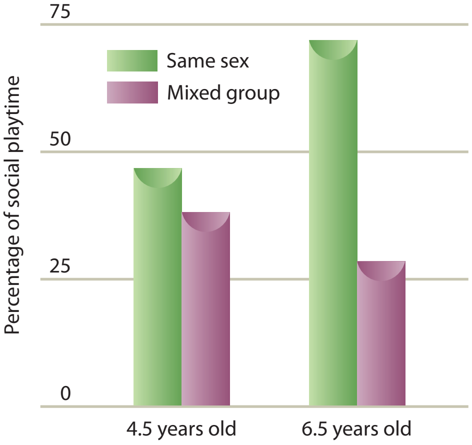


FIGURE **8.1**

DEVELOPMENTAL CHANGES IN PERCENTAGE OF TIME SPENT IN SAME-SEX AND MIXED-GROUP SETTINGS. Observations of children show that they are more likely to play in same-sex than mixed-sex groups. This tendency increases between 4 and 6 years of age.

What role does gender play in children's peer relations?

groups of six children were permitted to use play materials in any way they wished (Benenson, Apostolaris, & Parnass, 1997). Girls were more likely than boys to play in dyads or triads, while boys were more likely to interact in larger groups and seek to attain a group goal.

- *Interaction in same-sex groups.* Boys are more likely than girls to engage in rough-and-tumble play, competition, conflict, ego displays, risk taking, and seeking dominance. By contrast, girls are more likely to engage in "collaborative discourse," in which they talk and act in a more reciprocal manner.

Cognitive Influences Observation, imitation, rewards and punishment—these are the mechanisms by which gender develops according to social cognitive theory. Interactions between the child and the social environment are the main keys to gender development in this view. Some critics who adopt a cognitive approach argue that this explanation pays too little attention to the child's own mind and understanding, and portrays the child as passively acquiring gender roles (Martin & Ruble, 2004).

One influential cognitive theory is **gender schema theory,** which states that gender-typing emerges as children gradually develop gender schemas of what is gender-appropriate and gender-inappropriate in their culture (Blakemore, Berenbaum, & Liben, 2009; Zosuls, Lurye, & Ruble, 2008). A *schema* is a cognitive structure, a network of associations that guide an individual's perceptions. A *gender schema* organizes the world in terms of female and male. Children are internally motivated to perceive the world and to act in accordance with their developing schemas. Bit by bit, children pick up what is gender-appropriate and gender-inappropriate in their culture, and develop gender schemas that shape how they perceive the world and what they remember (Blakemore, Berenbaum, & Liben, 2009). Children are motivated to act in ways that conform with these gender schemas. Thus, gender schemas fuel gender-typing.

gender schema theory The theory that gender-typing emerges as children develop gender schemas of their culture's gender-appropriate and gender-inappropriate behavior.

Review *Connect* Reflect

LG1 Discuss emotional and personality development in early childhood.

Review

- What changes in the self occur during early childhood?
- What changes take place in emotional development in early childhood?
- What are some key aspects of moral development in young children?
- How does gender develop in young children?

Connect

- In the previous section, you read about the influence of parents on children's gender development. How does this compare with what you learned about parental influences on children's temperament in Chapter 6?

Reflect *Your Own Personal Journey of Life*

- Imagine that you are the parent of a 4-year-old child. What strategies would you use to increase your child's understanding of others?

2 Families

LG2 Explain how families can influence young children's development.

Parenting

Child Maltreatment

Sibling Relationships and Birth Order

The Changing Family in a Changing Society

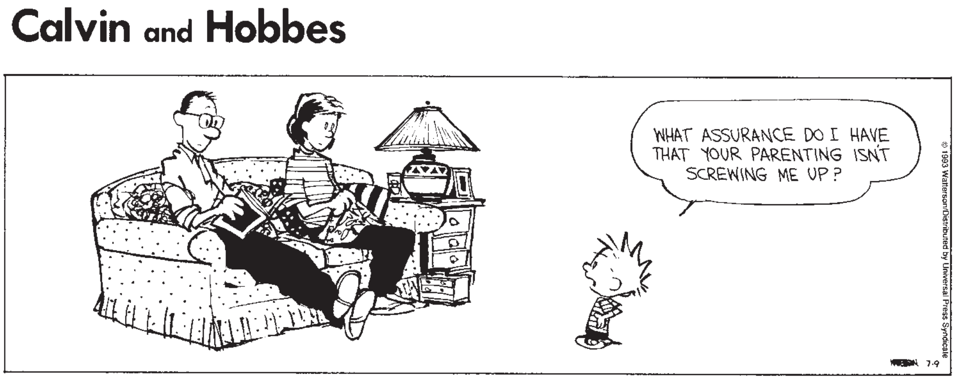
Attachment to a caregiver is a key social relationship during infancy, but we saw in Chapter 6 that some experts maintain that secure attachment and the infant years have been overdramatized as determinants of life-span development. Social and emotional development is also shaped by other relationships and by temperament, contexts, and social experiences in the early childhood years and later. In this section, we will discuss social relationships in early childhood beyond attachment. We will explore different types of parenting, sibling relationships, and variations in family structures.

PARENTING

Good parenting takes time and effort. You can't do it in a minute here and a minute there. You can't do it with CDs. Of course, it's not just the quantity of time parents spend with children that is important for children's development—the quality of the parenting is clearly important (Benzies, Keown, & Magill-Evans, 2009; Chen, 2009a, b; Gross & others, 2009). To understand variations in parenting, let's consider the styles parents use when they interact with their children, how they discipline their children, and coparenting.

Baumrind's Parenting Styles Diana Baumrind (1971) argues parents should be neither punitive nor aloof. Rather, they should develop rules for their children and be affectionate with them. She has described four types of parenting styles:

- **Authoritarian parenting** is a restrictive, punitive style in which parents exhort the child to follow their directions and respect their work and effort. The authoritarian parent places firm limits and controls on the child and allows little verbal exchange. For example, an authoritarian parent might say, "You do it my way or else." Authoritarian parents also might spank the child frequently, enforce rules rigidly but not explain them, and show rage toward the child. Children of authoritarian parents are often unhappy, fearful, and anxious about comparing themselves with others, fail to initiate activity, and have weak communication skills.


Calvin and Hobbes
WHAT ASSURANCE DO I HAVE THAT YOUR PARENTING ISN'T SCREWING ME UP?
© 1993 Watterson/Distributed by Universal Press Syndicate
WATTERSON 7-9

CALVIN & HOBBES, © Watterson. Distributed by Universal UClick. Reprinted with permission. All Rights Reserved.

authoritarian parenting A restrictive, punitive style in which parents exhort the child to follow their directions and to respect their work and effort. The authoritarian parent places firm limits and controls on the child and allows little verbal exchange. Authoritarian parenting is associated with children's social incompetence.

authoritative parenting A parenting style in which parents encourage their children to be independent but still place limits and controls on their actions. Extensive verbal give-and-take is allowed, and parents are warm and nurturant toward the child. Authoritative parenting is associated with children's social competence.

neglectful parenting A style of parenting in which the parent is very uninvolved in the child's life; it is associated with children's social incompetence, especially a lack of self-control.

indulgent parenting A style of parenting in which parents are highly involved with their children but place few demands or controls on them. Indulgent parenting is associated with children's social incompetence, especially a lack of self-control.

Parenting is a very important profession, but no test of fitness for it is ever imposed in the interest of children.

—George Bernard Shaw

Irish Playwright, 20th Century

- **Authoritative parenting** encourages children to be independent but still places limits and controls on their actions. Extensive verbal give-and-take is allowed, and parents are warm and nurturant toward the child. An authoritative parent might put his arm around the child in a comforting way and say, "You know you should not have done that. Let's talk about how you can handle the situation better next time." Authoritative parents show pleasure and support in response to children's constructive behavior. They also expect mature, independent, and age-appropriate behavior by children. Children whose parents are authoritative are often cheerful, self-controlled and self-reliant, and achievement-oriented; they tend to maintain friendly relations with peers, cooperate with adults, and cope well with stress.
- **Neglectful parenting** is a style in which the parent is very uninvolved in the child's life. Children whose parents are neglectful develop the sense that other aspects of the parents' lives are more important than they are. These children tend to be socially incompetent. Many have poor self-control and don't handle independence well. They frequently have low self-esteem, are immature, and may be alienated from the family. In adolescence, they may show patterns of truancy and delinquency.
- **Indulgent parenting** is a style in which parents are highly involved with their children but place few demands or controls on them. Such parents let their children do what they want. The result is that the children never learn to control their own behavior and always expect to get their way. Some parents deliberately rear their children in this way because they believe the combination of warm involvement and few restraints will produce a creative, confident child. However, children whose parents are indulgent rarely learn respect for others and have difficulty controlling their behavior. They might be domineering, egocentric, noncompliant, and have difficulties in peer relations.

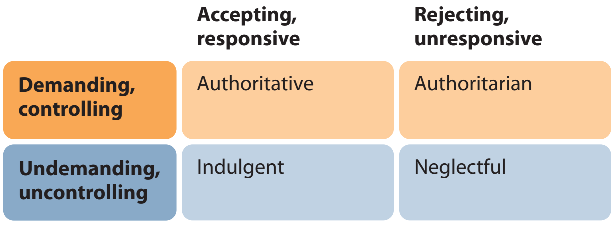
These four classifications of parenting involve combinations of acceptance and responsiveness on the one hand and demand and control on the other (Maccoby & Martin, 1983). How these dimensions combine to produce authoritarian, authoritative, neglectful, and indulgent parenting is shown in Figure 8.2.

Keep in mind that research on parenting styles and children's development is *correlational*, not causal, in nature. Thus, if a study reveals that authoritarian parenting is linked to higher levels of children's aggression, it may be that aggressive children elicited authoritarian parenting just as much as authoritarian parenting produced aggressive children. Also recall from Chapter 1 that, in correlational studies, a third factor may influence the correlation between two factors. Thus, in the example of the correlation between authoritarian parenting and children's aggression, possibly authoritarian parents (first factor) and aggressive children (second factor) share genes (third factor) that predispose them to behave in ways that produced the correlation.

Parenting Styles in Context Do the benefits of authoritative parenting transcend the boundaries of ethnicity, socioeconomic status (SES), and household composition? Although occasional exceptions have been found, evidence linking authoritative parenting with competence on the part of the child occurs in research across a wide range of ethnic groups, social strata, cultures, and family structures (Steinberg & Silk, 2002).

Nonetheless, researchers have found that in some ethnic groups, aspects of the authoritarian style may be associated with more positive child outcomes than Baumrind predicts (Parke & Buriel, 2006). Elements of the authoritarian style may take on different meanings and have different effects depending on the context.

For example, Asian American parents often continue aspects of traditional Asian child-rearing practices that have sometimes been described



	Accepting, responsive	**Rejecting, unresponsive**
Demanding, controlling	Authoritative	Authoritarian
Undemanding, uncontrolling	Indulgent	Neglectful

FIGURE **8.2**

CLASSIFICATION OF PARENTING STYLES. The four types of parenting styles (authoritative, authoritarian, indulgent, and neglectful) involve the dimensions of acceptance and responsiveness, on the one hand, and demand and control on the other. For example, authoritative parenting involves being both accepting/responsive and demanding/controlling.

as authoritarian. The parents exert considerable control over their children's lives. However, Ruth Chao (2001, 2005, 2007; Chao & Tseng, 2002) argues that the style of parenting used by many Asian American parents is distinct from the domineering control of the authoritarian style. Instead, Chao argues that the control reflects concern and involvement in their children's lives and is best conceptualized as a type of training. The high academic achievement of Asian American children may be a consequence of their "training" parents (Stevenson & Zusho, 2002).

An emphasis on requiring respect and obedience is also associated with the authoritarian style, but in Latino child rearing this focus may be positive rather than punitive. Rather than suppressing the child's development, it may encourage the development of a self and an identity that are embedded in the family and require respect and obedience (Harwood & others, 2002).

Even physical punishment, another characteristic of the authoritarian style, may have varying effects in different contexts. African American parents are more likely than non-Latino White parents to use physical punishment (Deater-Deckard & Dodge, 1997). However, the use of physical punishment has been linked with increased externalized child problems (such as acting out and high levels of aggression) in non-Latino White families but not in African American families. One explanation of this finding points to the need for African American parents to enforce rules in the dangerous environments in which they are more likely to live (Harrison-Hale, McLoyd, & Smedley, 2004). As we see next, though, overall, the use of physical punishment in disciplining children raises many concerns.

According to Ruth Chao, which type of parenting style do many Asian American parents use?

Punishment For centuries, corporal (physical) punishment, such as spanking, has been considered a necessary and even desirable method of disciplining children. Use of corporal punishment is legal in every state in America. A national survey of U.S. parents with 3- and 4-year-old children found that 26 percent of parents reported spanking their children frequently, and 67 percent of the parents reported yelling at their children frequently (Regalado & others, 2004). A cross-cultural comparison found that individuals in the United States and Canada were among those with the most favorable attitudes toward corporal punishment and were the most likely to remember it being used by their parents (Curran & others, 2001) (see Figure 8.3).

An increasing number of studies have examined the outcomes of physically punishing children, although those that have been conducted are correlational. Clearly, it would be highly unethical to randomly assign parents to either spank or not spank their children in an experimental study. Recall that cause and effect cannot be determined in a correlational study. In one correlational study, spanking by parents was linked with children's antisocial behavior, including cheating, telling lies, being mean to others, bullying, getting into fights, and being disobedient (Strauss, Sugarman, & Giles-Sims, 1997).

A research review concluded that corporal punishment by parents is associated with higher levels of immediate compliance and aggression by the children (Gershoff, 2002). The review also found that corporal punishment is linked to lower levels of moral internalization and mental health (Gershoff, 2002). A recent study also discovered that a history of harsh physical discipline was related to adolescent depression and externalized problems, such as juvenile delinquency (Bender & others, 2007).

What are some reasons for avoiding spanking or similar punishments? The reasons include:

- When adults punish a child by yelling, screaming, or spanking, they are presenting children with out-of-control models for handling stressful situations. Children may imitate this aggressive, out-of-control behavior.

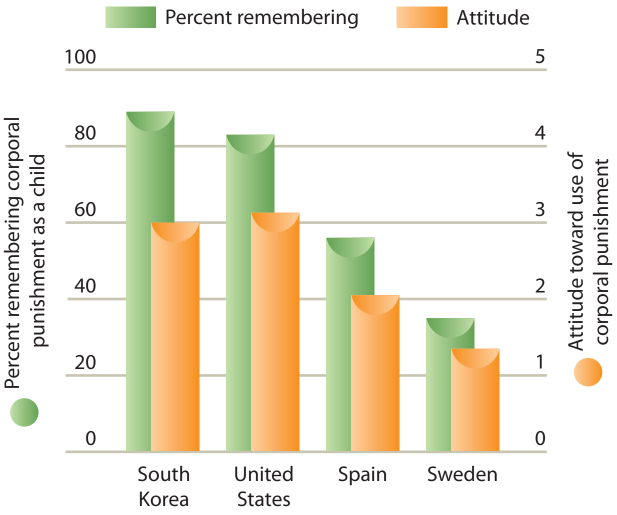


FIGURE **8.3**

CORPORAL PUNISHMENT IN DIFFERENT COUNTRIES. A 5-point scale was used to assess attitudes toward corporal punishment with scores closer to 1 indicating an attitude against its use and scores closer to 5 suggesting an attitude favoring its use. *Why are studies of corporal punishment correlational studies, and how does that affect their usefulness?*

- Punishment can instill fear, rage, or avoidance. For example, spanking the child may cause the child to avoid being around the parent and to fear the parent.
- Punishment tells children what not to do rather than what to do. Children should be given feedback, such as "Why don't you try this?"
- Punishment can be abusive. Parents might unintentionally become so aroused when they are punishing the child that they become abusive (Knox, 2010).

Most child psychologists recommend handling misbehavior by reasoning with the child, especially explaining the consequences of the child's actions for others. *Time out*, in which the child is removed from a setting that offers positive reinforcement, can also be effective. For example, when the child has misbehaved, a parent might take away TV viewing for a specified time.

A final point about the use of punishment with children is that debate about its effects on children's development continues (Grusec, 2009; Thompson, 2009b). Some experts (including Diana Baumrind) argue that much of the evidence for the negative effects of physical punishment are based on studies in which parents acted in an abusive manner (Baumrind, Larzelere, & Cowan, 2002). She concludes from her research that when parents used punishment in a calm, reasoned manner (which she says characterized most of the authoritative parents in her studies), children's development benefitted. Thus, she emphasizes that physical punishment does not need to present children with an out-of-control adult who is yelling and screaming, as well as spanking. A research review of 26 studies concluded that only severe or predominant use of spanking, not mild spanking, compared unfavorably with alternative discipline practices with children (Larzelere & Kuhn, 2005).

Indeed, there are few longitudinal studies of punishment and few studies that distinguish adequately between moderate and heavy use of punishment. Thus, in the view of some experts, based on the research evidence available, it is still difficult to tell whether the effects of physical punishment are harmful to children's development, although such a view might be distasteful to some individuals (Grusec, 2009). One thing that is clear regarding research on punishment of children is that if physical punishment is used it needs to be mild, infrequent, age-appropriate, and used in the context of a positive parent-child relationship (Grusec, 2011). It is also clear that when physical punishment involves abuse, it can be very harmful to children's development (Cicchetti & others, 2010b; Knox, 2010).

Coparenting The relationship between marital conflict and the use of punishment highlights the importance of *coparenting,* which is the support that parents provide one another in jointly raising a child. Poor coordination between parents, undermining of the other parent, lack of cooperation and warmth, and disconnection by one parent are conditions that place children at risk for problems (McHale & Sullivan, 2008). A recent study revealed that coparenting predicted young children's effortful control above and beyond maternal and paternal parenting (Karreman & others, 2008).

Parents who do not spend enough time with their children or who have problems in child rearing can benefit from counseling and therapy. To read about the work of marriage and family counselor Darla Botkin, see *Connecting With Careers*.

What characterizes coparenting?

CHILD MALTREATMENT

Unfortunately, punishment sometimes leads to the abuse of infants and children (Corso & Fertig, 2010; Macmillan, 2010). In 2006, approximately 905,000 U.S. children were found to be victims of child abuse (U.S. Department of Health and Human Services, 2008). Eighty-four

connecting with careers

Darla Botkin, Marriage and Family Therapist

Darla Botkin is a marriage and family therapist who teaches, conducts research, and engages in marriage and family therapy. She is on the faculty of the University of Kentucky. Botkin obtained a bachelor's degree in elementary education with a concentration in special education and then went on to receive a master's degree in early childhood education. She spent the next six years working with children and their families in a variety of settings, including child care, elementary school, and Head Start. These experiences led Botkin to recognize the interdependence of the developmental settings that children and their parents experience (such as home, school, and work). She returned to graduate school and obtained a Ph.D. in family studies from the University of Tennessee. She then became a faculty member in the Family Studies program at the University of Kentucky. Completing further coursework and clinical training in marriage and family therapy, she became certified as a marriage and family therapist.

Botkin's current interests include working with young children in family therapy, gender and ethnic issues in family therapy, and the role of spirituality in family wellness.

Darla Botkin (*left*), conducting a family therapy session.

For more information about what marriage and family therapists do, see page 48 in the Careers in Life-Span Development appendix.

percent of these children were abused by a parent or parents. Laws in many states now require physicians and teachers to report suspected cases of child abuse, yet many cases go unreported, especially those of battered infants.

Whereas the public and many professionals use the term *child abuse* to refer to both abuse and neglect, developmentalists increasingly use the term *child maltreatment* (Cicchetti, 2011; Cicchetti & Toth, 2011; Cicchetti & others, 2010a, b). This term does not have quite the emotional impact of the term *abuse* and acknowledges that maltreatment includes diverse conditions.

> Child maltreatment involves grossly inadequate and destructive aspects of parenting.
>
> —Dante Cicchetti
>
> *Contemporary Developmental Psychologist, University of Minnesota.*

Types of Child Maltreatment The four main types of child maltreatment are physical abuse, child neglect, sexual abuse, and emotional abuse (National Clearinghouse on Child Abuse and Neglect, 2004):

- *Physical abuse* is characterized by the infliction of physical injury as a result of punching, beating, kicking, biting, burning, shaking, or otherwise harming a child. The parent or other person may not have intended to hurt the child; the injury may have resulted from excessive physical punishment (Milot & others, 2010).
- *Child neglect* is characterized by failure to provide for the child's basic needs (Newton & Vandeven, 2010; Thompson, 2010). Neglect can be physical (abandonment, for example), educational (allowing chronic truancy, for example), or emotional (marked inattention to the child's needs, for example). Child neglect

Eight-year-old Donnique Hein lovingly holds her younger sister, six-month-old Maria Paschel, after a meal at Laura's Home, a crisis shelter in Westpark run by the City Mission, in March, 2010.

is by far the most common form of child maltreatment. In every country where relevant data have been collected, neglect occurs up to three times as often as abuse (Benoit, Coolbear, & Crawford, 2008).

- *Sexual abuse* includes fondling a child's genitals, intercourse, incest, rape, sodomy, exhibitionism, and commercial exploitation through prostitution or the production of pornographic materials (Bahali & others, 2010; Leventhal, Murphy, & Asnes, 2010).
- *Emotional abuse (psychological/verbal abuse/mental injury)* includes acts or omissions by parents or other caregivers that have caused, or could cause, serious behavioral, cognitive, or emotional problems (van Harmelen & others, 2010; Wekerle & others, 2009).

Although any of these forms of child maltreatment may be found separately, they often occur in combination. Emotional abuse is almost always present when other forms are identified.

The Context of Abuse No single factor causes child maltreatment (Cicchetti, 2011; Cicchetti & others, 2010a; Cicchetti, & Toth, 2011). A combination of factors, including the culture, family, and developmental characteristics of the child, likely contribute to child maltreatment (Appleton & Stanley, 2009; Prinz & others, 2009).

The extensive violence that takes place in American culture, including TV violence, is reflected in the occurrence of violence in the family (Durrant, 2008). The family itself is obviously a key part of the context of abuse (Kennedy, 2009; Macmillan & others, 2009). The interactions of all family members need to be considered, regardless of who performs the violent acts against the child. For example, even though the father may be the one who physically abuses the child, the behavior of the mother, the child, and siblings also should be evaluated.

Were parents who abuse children abused by their own parents? About one-third of parents who were abused themselves when they were young go on to abuse their own children (Cicchetti & Toth, 2006). Thus, some, but not a majority, of parents are involved in an intergenerational transmission of abuse.

Developmental Consequences of Abuse Among the consequences of child maltreatment in childhood and adolescence are poor emotion regulation, attachment problems, problems in peer relations, difficulty in adapting to school, and other psychological problems such as depression and delinquency. As shown in Figure 8.4, maltreated young children in foster care were more likely to show abnormal stress hormone levels than middle-SES young children living with their birth family (Gunnar, Fisher, & the Early Experience, Stress, and Prevention Network, 2006). In this study, the abnormal stress hormone levels were mainly present in the foster children who were neglected, best described as "institutional neglect" (Fisher, 2005). Abuse also may have this effect on young children (Gunnar & Fisher, 2006). Adolescents who experienced abuse or neglect as children are more likely than adolescents who were not maltreated as children to engage in violent romantic relationships, delinquency, sexual risk taking, and substance abuse (Shin, Hong, & Hazen, 2010; Wekerle & others, 2009).

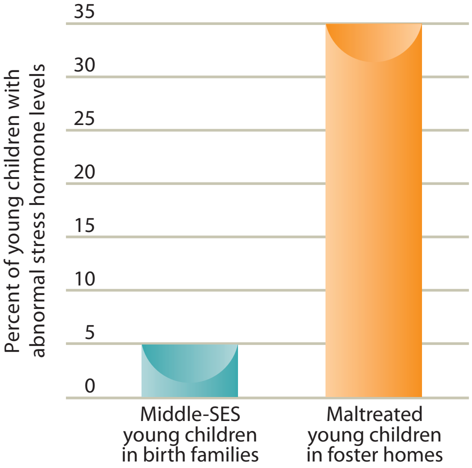


FIGURE **8.4**

ABNORMAL STRESS HORMONE LEVELS IN YOUNG CHILDREN IN DIFFERENT TYPES OF REARING CONDITIONS

Later, during the adult years, individuals who were maltreated as children often have difficulty in establishing and maintaining healthy intimate relationships (Dozier, Stovall-McClough, & Albus, 2009). As adults, maltreated children are also at higher risk for violent behavior toward other adults—especially dating partners and marital partners—as well as for substance abuse, anxiety, and depression (Miller-Perrin, Perrin, & Kocur, 2009).

What can be done to prevent or reduce the incidence of child maltreatment? In one study of maltreating mothers and their 1-year-olds, two treatments were effective in reducing child maltreatment: (1) home visitation that emphasized improved parenting, coping with stress, and increasing support for the mother; and (2) parent-infant psychotherapy that focused on improving maternal-infant attachment (Cicchetti, Toth, & Rogosch, 2005).

SIBLING RELATIONSHIPS AND BIRTH ORDER

How do developmentalists characterize sibling relationships? How extensively does birth order influence behavior?

Sibling Relationships Approximately 80 percent of American children have one or more siblings—that is, sisters and brothers (Dunn, 2007). Any of you who have grown up with siblings probably have a rich memory of aggressive, hostile interchanges. Siblings in the presence of each other when they are 2 to 4 years of age, on average, have a conflict once every 10 minutes and then the conflicts go down somewhat from 5 to 7 years of age (Kramer, 2006). What do parents do when they encounter siblings having a verbal or physical confrontation? One study revealed that they do one of three things: (1) intervene and try to help them resolve the conflict, (2) admonish or threaten them, or (3) do nothing at all (Kramer & Perozynski, 1999). Of interest is that in families with two siblings 2 to 5 years of age, the most frequent parental reaction is to do nothing at all.

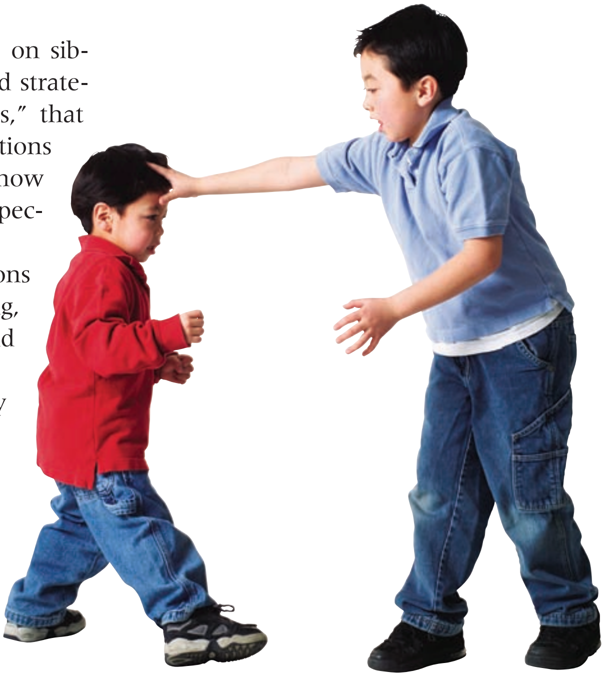
Laurie Kramer (2006), who has conducted a number of research studies on siblings, says that not intervening and letting sibling conflict escalate are not good strategies. She developed a program titled, "More Fun with Sisters and Brothers," that teaches 4- to 8-year-old siblings social skills for developing positive interactions (Kramer & Radey, 1997). Among the social skills taught in the program are how to appropriately initiate play, how to accept and refuse invitations to play, perspective taking, how to deal with angry feelings, and how to manage conflict.

However, conflict is only one of the many dimensions of sibling relations (Steelman & Koch, 2009). Sibling relations include helping, sharing, teaching, fighting, and playing, and siblings can act as emotional supports, rivals, and communication partners.

Judy Dunn (2007), a leading expert on sibling relationships, recently described three important characteristics of sibling relationships:

- *Emotional quality of the relationship.* Both intensive positive and negative emotions are often expressed by siblings toward each other. Many children and adolescents have mixed feelings toward their siblings.
- *Familiarity and intimacy of the relationship.* Siblings typically know each other very well, and this intimacy suggests that they can either provide support or tease and undermine each other, depending on the situation.
- *Variation in sibling relationships.* Some siblings describe their relationships more positively than others. Thus, there is considerable variation in sibling relationships. We just discussed that many siblings have mixed feelings about each other, but some children and adolescents mainly describe their sibling in warm, affectionate ways, whereas others primarily talk about how irritating and mean a sibling is.

Birth Order Whether a child has older or younger siblings has been linked to development of certain personality characteristics. For example, a recent review concluded that "firstborns are the most intelligent, achieving, and conscientious, while later-borns are the most rebellious, liberal, and agreeable" (Paulhus, 2008,



What characterizes children's sibling relationships?

developmental **connection**

Family. Siblings who are psychologically close to each other in adulthood tended to be that way in childhood. Chapter 16, p. 518

p. 210). Compared with later-born children, firstborn children have also been described as more adult-oriented, helpful, conforming, and self-controlled. However, when such birth-order differences are reported, they often are small.

What accounts for such differences related to birth order? Proposed explanations usually point to variations in interactions with parents and siblings associated with being in a particular position in the family. In one study, mothers became more negative, coercive, and restraining and played less with the firstborn following the birth of a second child (Dunn & Kendrick, 1982).

What is the only child like? The popular conception is that the only child is a "spoiled brat," with such undesirable characteristics as dependency, lack of self-control, and self-centered behavior. But researchers present a more positive portrayal of the only child. Only children often are achievement-oriented and display a desirable personality, especially in comparison with later-borns and children from large families (Falbo & Poston, 1993; Jiao, Ji, & Jing, 1996).

The one-child family is becoming much more common in China because of the strong motivation to limit the population growth in the People's Republic of China. The policy is still relatively new, and its effects on children have not been fully examined. *In general, though, what have researchers found the only child to be like?*

So far, our discussion suggests that birth order might be a strong predictor of behavior. However, an increasing number of family researchers stress that, when all of the factors that influence behavior are considered, birth order itself shows limited ability to predict behavior. Think about some of the other important factors in children's lives that influence their behavior beyond birth order. They include heredity, models of competency or incompetency that parents present to children on a daily basis, peer influences, school influences, socioeconomic factors, sociohistorical factors, and cultural variations. When someone says firstborns are always like this but last-borns are always like that, the person is making overly simplistic statements that do not adequately take into account the complexity of influences on a child's development.

THE CHANGING FAMILY IN A CHANGING SOCIETY

Beyond variations in the number of siblings, the families that children experience differ in many important ways. The number of children growing up in single-parent families is staggering. As shown in Figure 8.5, the United States has one of the highest percentage of single-parent families in the world. Among two-parent families, there are those in which both parents work, or have divorced parents who have remarried, or gay or lesbian parents. Differences in culture and socioeconomic status (SES) also influence families. How do these variations in families affect children?

Working Parents More than one of every two U.S. mothers with a child under the age of 5 is in the labor force; more than two of every three with a child from 6 to 17 years of age is. Maternal employment is a part of modern life, but its effects are still debated.

Work can produce positive and negative effects on parenting (Han, 2009). Recent research indicates that what matters for children's development is the nature of the parents' work rather than whether one or both parents works outside the

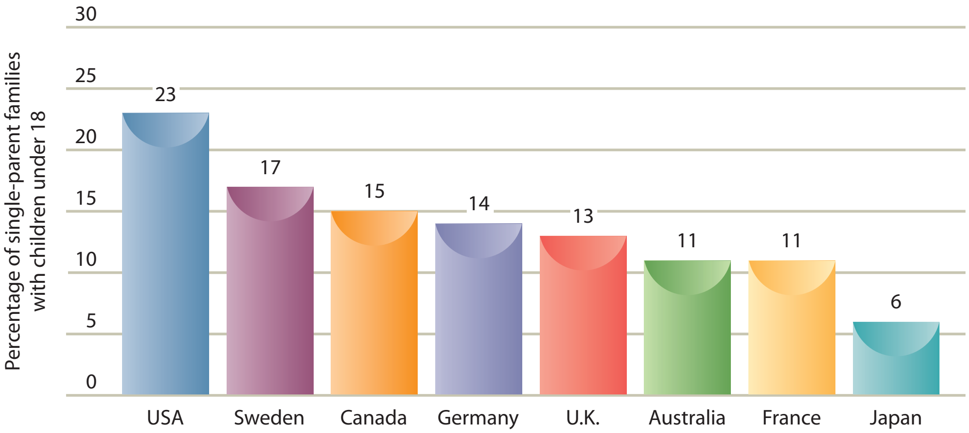


FIGURE **8.5**

SINGLE-PARENT FAMILIES IN DIFFERENT COUNTRIES

home (Goldberg & Lucas-Thompson, 2008). Ann Crouter (2006) recently described how parents bring their experiences at work into their homes. She concluded that parents who have poor working conditions, such as long hours, overtime work, stressful work, and lack of autonomy at work, are likely to be more irritable at home and engage in less effective parenting than their counterparts who have better work conditions in their jobs. A consistent finding is the children (especially girls) of working mothers engage in less gender stereotyping and have more egalitarian views of gender (Goldberg & Lucas-Thompson, 2008).

Children in Divorced Families Divorce rates changed rather dramatically in the United States and many countries around the world in the late 20th century (Amato & Dorius, 2010). The U.S. divorce rate increased dramatically in the 1960s and 1970s but has declined since the 1980s. However, the divorce rate in the United States is still much higher than in most other countries.

It is estimated that 40 percent of children born to married parents in the United States will experience their parents' divorce (Hetherington & Stanley-Hagan, 2002). Let's examine some important questions about children in divorced families.

Are children better adjusted in intact, never-divorced families than in divorced families? Most researchers agree that children from divorced families show poorer adjustment than their counterparts in nondivorced families (Amato & Dorius, 2010; Hetherington, 2006; Wallerstein, 2008) (see Figure 8.6). Those who have experienced multiple divorces are at greater risk. Children in divorced families are more likely than children in nondivorced families to have academic problems, to show externalized problems (such as acting out and delinquency) and internalized problems (such as anxiety and depression), to be less socially responsible, to have less competent intimate relationships, to drop out of school, to become sexually active at an early age, to take drugs, to associate with antisocial peers, to have low self-esteem, and to be less securely attached as young adults (Conger & Chao, 1996). Nonetheless, keep in mind that a majority of children in divorced families do not have significant adjustment problems (Ahrons, 2007). One study found that 20 years after their parents had divorced when they were children, approximately 80 percent of adults concluded that their parents' decision to divorce was a wise one (Ahrons, 2004).

Should parents stay together for the sake of the children? Whether parents should stay in an unhappy or conflicted marriage for the sake of their children is one of the most commonly asked questions about divorce (Hetherington, 2006). If the stresses and disruptions in family relationships associated with an unhappy, conflictual marriage that erode the well-being of children are reduced by the move to a divorced, single-parent family, divorce can be advantageous. However, if the diminished resources and increased risks associated with divorce also are accompanied by inept parenting and sustained or increased conflict, not only between the divorced couple but also among the parents, children, and siblings, the best choice for the children would be that an unhappy marriage is retained (Hetherington & Stanley-Hagan, 2002). It is difficult to determine how these "ifs" will play out when parents either remain together in an acrimonious marriage or become divorced.

Note that marital conflict may have negative consequences for children in the context of marriage or divorce (Cox & others, 2008). And many of the problems that children from divorced homes experience begin during the predivorce period, a time when parents are often in active conflict with each other. Thus, when children from divorced homes show problems, the problems may not be due only to the divorce, but also to the marital conflict that led to it (Thompson, 2008).

How much do family processes matter in divorced families? Family processes matter a great deal (Wallerstein, 2008). For example, when divorced parents' relationship with each other is harmonious, and when they use authoritative parenting, the adjustment of children improves (Hetherington, 2006).

What factors influence an individual child's vulnerability to suffering negative consequences as a result of living in a divorced family? Among the factors involved in the child's risk

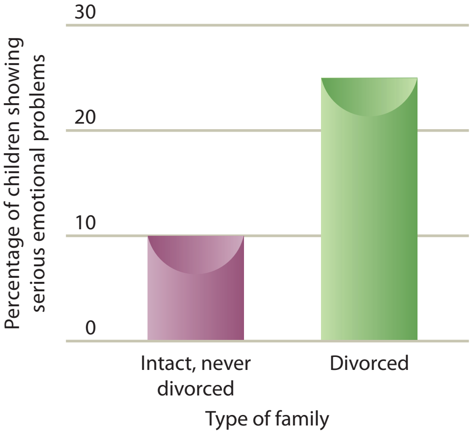


FIGURE **8.6**

DIVORCE AND CHILDREN'S EMOTIONAL PROBLEMS. In Hetherington's research, 25 percent of children from divorced families showed serious emotional problems compared with only 10 percent of children from intact, never-divorced families. However, keep in mind that a substantial majority (75 percent) of the children from divorced families did not show serious emotional problems.

developmental **connection**

Family. Early marriage, low educational level, low income, not having a religious affiliation, having parents who are divorced, and having a baby before marriage are factors linked to an increased probability of divorce. Chapter 14, p. 459

What concerns are involved in whether parents should stay together for the sake of the children or become divorced?

As marriage has become a more optional, less permanent institution in contemporary America, children and adolescents are encountering stresses and adaptive challenges associated with their parents' marital transitions.

—E. Mavis Hetherington

Contemporary Psychologist, University of Virginia

and vulnerability is the child's adjustment prior to the divorce, as well as the child's personality and temperament, gender, and custody situation (Hetherington, 2006). Children whose parents later divorce show poorer adjustment before the breakup (Amato & Booth, 1996). Children who are socially mature and responsible, who show few behavioral problems, and who have an easy temperament are better able to cope with their parents' divorce. Children with a difficult temperament often have problems in coping with their parents' divorce (Hetherington, 2000).

Earlier studies reported gender differences in response to divorce, with divorce being more negative for boys than girls in mother-custody families. However, more recent studies have shown that gender differences are less pronounced and consistent than was previously believed. Some of the inconsistency may be due to the increase in father custody, joint custody, and increased involvement of noncustodial fathers, especially in their sons' lives (Ziol-Guest, 2009). Research on whether different types of custodial arrangements are better for children in divorced families has been inconsistent (Spruijt & Duindam, 2010).

An analysis of studies found that children in joint-custody families were better adjusted than children in sole-custody families (Bauserman, 2002). Some studies have shown that boys adjust better in father-custody families, girls in mother-custody families, whereas other studies have not (Maccoby & Mnookin, 1992; Santrock & Warshak, 1979; Ziol-Guest, 2009).

What role does socioeconomic status play in the lives of children in divorced families? Custodial mothers experience the loss of about one-fourth to one-half of their predivorce income, in comparison with a loss of only one-tenth by custodial fathers. This income loss for divorced mothers is accompanied by increased workloads, high rates of job instability, and residential moves to less desirable neighborhoods with inferior schools (Sayer, 2006).

In sum, many factors are involved in determining how divorce influences a child's development (Amato & Dorius, 2010; Hetherington, 2006). To read about some strategies for helping children cope with the divorce of their parents, see *Connecting Development to Life*.

Gay and Lesbian Parents Increasingly, gay and lesbian couples are creating families that include children. Approximately 20 percent of lesbians and 10 percent of gays are parents (Patterson, 2009a, b). There may be more than 1 million gay and lesbian parents in the United States today.

Like heterosexual couples, gay and lesbian parents vary greatly. They may be single or they may have same-gender partners. Many lesbian mothers and gay fathers are noncustodial parents because they lost custody of their children to heterosexual spouses after a divorce.

Most children of gay and lesbian parents were born in a heterosexual relationship that ended in a divorce—in most cases, it was probably a relationship in which one or both parents only later identified themselves as gay or lesbian. In other cases, lesbians and gays became parents as a result of donor insemination and surrogates, or through adoption.

Parenthood among lesbians and gays is controversial. Opponents claim that being raised by gay or lesbian parents harms the child's development. But researchers have found few differences between children growing up with lesbian mothers or gay fathers on the one hand, and children growing up with heterosexual parents on the other (Golombok & Tasker, 2010; Patterson, 2009a, b). For example, children growing up in gay or lesbian families are just as popular with their peers, and no differences are found in the adjustment and mental health of children living in these families when they are compared with children in heterosexual families (Hyde, 2007). Contrary to the once-popular expectation that being raised by a gay or lesbian parent would result in the child growing up to be gay or lesbian, in fact the overwhelming majority of children from gay or lesbian families have a heterosexual orientation (Golombok & Tasker, 2010; Tasker & Golombok, 1997).

What are the research findings regarding the development and psychological well-being of children raised by gay and lesbian couples?

connecting development to life

Communicating With Children About Divorce

Ellen Galinsky and Judy David (1988) developed a number of guidelines for communicating with children about divorce.

- ***Explain the separation.*** As soon as daily activities in the home make it obvious that one parent is leaving, tell the children. If possible, both parents should be present when children are told about the separation to come. The reasons for the separation are very difficult for young children to understand. No matter what parents tell children, children can find reasons to argue against the separation. It is extremely important for parents to tell the children who will take care of them and to describe the specific arrangements for seeing the other parent.
- ***Explain that the separation is not the child's fault.*** Young children often believe their parents' separation or divorce is their own fault. Therefore, it is important to tell children that they are not the cause of the separation. Parents need to repeat this a number of times.
- ***Explain that it may take time to feel better.*** Tell young children that it's normal to not feel good about what is happening and that many other children feel this way when their parents become separated. It is also okay for divorced parents to share some of their emotions with children, by saying something like "I'm having a hard time since the separation just like you, but I know it's going to get better after a while." Such statements are best kept brief and should not criticize the other parent.
- ***Keep the door open for further discussion.*** Tell your children to come to you anytime they want to talk about the separation. It is healthy for children to express their pent-up emotions in discussions with their parents and to learn that the parents are willing to listen to their feelings and fears.
- ***Provide as much continuity as possible.*** The less children's worlds are disrupted by the separation, the easier their transition to a single-parent family will be. Thus, parents should maintain the rules already in place as much as possible. Children need parents who care enough not only to give them warmth and nurturance but also to set reasonable limits.
- ***Provide support for your children and yourself.*** After a divorce or separation, parents are as important to children as before the divorce or separation. Divorced parents need to provide children with as much support as possible. Parents function best when other people are available to give them support as adults and as parents. Divorced parents can find people who provide practical help and with whom they can talk about their problems.

How does the third bullet point above ("Explain that it may take time to feel better.") relate to what you learned earlier in this chapter about emotion coaching?

Cultural, Ethnic, and Socioeconomic Variations Parenting can be influenced by culture, ethnicity, and socioeconomic status (Tamis-LeMonda & McFadden, 2010). Recall from Bronfenbrenner's ecological theory (see Chapter 1) that a number of social contexts influence the child's development. In Bronfenbrenner's theory, culture, ethnicity, and socioeconomic status are classified as part of the macrosystem because they represent broader, societal contexts.

Cross-Cultural Studies Different cultures often give different answers to such basic questions as what the father's role in the family should be, what support systems are available to families, and how children should be disciplined (Fiese & Winter, 2008; Hewlett & MacFarlan, 2010). There are important cross-cultural variations in parenting (Bornstein & Lansford, 2010; Gauvain & Parke, 2010). In some cultures, such as rural areas of many countries, authoritarian parenting is widespread.

Cultural change, brought about by such factors as increasingly frequent international travel, the Internet and electronic communications, and economic globalization, is coming to families in many countries around the world. There are trends toward greater family mobility, migration to urban areas, separation as some family members work in cities or countries far from their homes, smaller families, fewer extended-family households, and increases in maternal employment (Brown & Larson, 2002). These trends can change the resources that are available to children. For example, when several generations no longer live close by, children may lose support and guidance from grandparents, aunts, and uncles. On the positive side, smaller families may produce more openness and communication between parents and children.

What are some characteristics of families within different ethnic groups?

Ethnicity Families within different ethnic groups in the United States differ in their typical size, structure, composition, reliance on kinship networks, and levels of income and education (Liu & others, 2009). Large and extended families are more common among minority groups than among the White majority. For example, 19 percent of Latino families have three or more children, compared with 14 percent of African American and 10 percent of White families. African American and Latino children interact more with grandparents, aunts, uncles, cousins, and more distant relatives than do White children.

Single-parent families are more common among African Americans and Latinos than among White Americans (Brown & Lesane-Brown, 2009). In comparison with two-parent households, single parents often have more limited resources of time, money, and energy (Wilson, 2008). Ethnic minority parents also are less educated and more likely to live in low-income circumstances than their White counterparts. Still, many impoverished ethnic minority families manage to find ways to raise competent children (Hattery & Smith, 2007).

Of course, individual families vary, and how ethnic minority families deal with stress depends on many factors (Galindo & Durham, 2009; Tamis-LeMonda & McFadden, 2010; Wong, Kinzie, & Kinzie, 2009). Whether the parents are native-born or immigrants, how long the family has been in this country, its socioeconomic status, and its national origin all make a difference (Gauvain & Parke, 2010). The characteristics of the family's social context also influence its adaptation. What are the attitudes toward the family's ethnic group within its neighborhood or city? Can the family's children attend good schools? Are there community groups that welcome people from the family's ethnic group? Do members of the family's ethnic group form community groups of their own?

Ethnic minority children and their parents are expected to move beyond their own cultural background and identify with aspects of the dominant culture. They undergo varying degrees of *acculturation*, which refers to cultural changes that occur when one culture comes in contact with another. Asian American parents, for example, may feel pressed to modify the traditional training style of parental control discussed earlier as they encounter the more permissive parenting typical of the dominant culture.

Socioeconomic Status Low-income families have less access to resources than higher-income families (Philipsen, Johnson, & Brooks-Gunn, 2009; Tamis-LeMonda & McFadden, 2010). The differential in access to resources includes nutrition, health care, protection from danger, and enriching educational and socialization opportunities, such as tutoring and lessons in various activities. These differences are compounded in low-income families characterized by long-term poverty (Brandon, 2009).

In America and most Western cultures, differences have been found in child rearing among different socioeconomic-status (SES) groups (Hoff, Laursen, & Tardif, 2002, p. 246):

- "Lower-SES parents (1) are more concerned that their children conform to society's expectations, (2) create a home atmosphere in which it is clear that parents have authority over children," (3) use physical punishment more in disciplining their children, and (4) are more directive and less conversational with their children.
- "Higher-SES parents (1) are more concerned with developing children's initiative" and delay of gratification, "(2) create a home atmosphere in which children are more nearly equal participants and in which rules are discussed as opposed to being laid down" in an authoritarian manner, (3) are less likely to use physical punishment, and (4) "are less directive and more conversational" with their children.

Review *Connect* Reflect

LG2 Explain how families can influence young children's development.

Review

- What are the four main parenting styles, and what aspects of parenting are linked with young children's development?
- What are the types and consequences of child maltreatment?
- How are sibling relationships and birth order related to young children's development?
- How is young children's development affected by having two wage-earning parents, having divorced parents, having gay or lesbian parents, and being part of a particular cultural, ethnic, and socioeconomic group?

Connect

- In Chapter 4, you learned that fathers were the most often perpetrators of shaken baby syndrome. Given what you learned in this chapter, which family interactions would a researcher or marriage and family therapist be likely to explore in such a case of child maltreatment?

Reflect *Your Own Personal Journey of Life*

- Which style or styles of parenting did your mother and father use in rearing you? What effects do you think their parenting styles have had on your development?

3 Peer Relations, Play, and Television

LG3 Describe the roles of peers, play, and television in young children's development.

Peer Relations
Play
Television

The family is an important social context for children's development. However, children's development also is strongly influenced by what goes on in other social contexts, such as in peer groups and when children are playing or watching television.

PEER RELATIONS

As children grow older, they spend an increasing amount of time with their *peers*—children of about the same age or maturity level.

Peer Group Functions What are the functions of a child's peer group? One of its most important functions is to provide a source of information and comparison about the world outside the family. Children receive feedback about their abilities from their peer group. Children evaluate what they do in terms of whether it is better than, as good as, or worse than what other children do. It is hard to make these judgments at home because siblings are usually older or younger.

Good peer relations can be necessary for normal socioemotional development (Hartup, 2009; Ladd, 2009). Special concerns in peer relations focus on children who are withdrawn or aggressive (Rubin & Coplan, 2010; Smith, Rose, & Schwartz-Mette, 2010). Withdrawn children who are rejected by peers or are victimized and feel lonely are at risk for depression. Children who are aggressive with their peers are at risk for developing a number of problems, including delinquency and dropping out of school (Prinstein & others, 2009).

Developmental Changes Recall from our discussion of gender that, by about the age of 3, children already prefer to spend time with same-sex rather than opposite-sex playmates, and this preference increases in early

What are some characteristics of peer relations in early childhood?

childhood. During these same years the frequency of peer interaction, both positive and negative, picks up considerably (Coplan & Abreau, 2009). Many preschool children spend considerable time in peer interaction conversing with playmates about such matters as "negotiating roles and rules in play, arguing, and agreeing" (Rubin, Bukowski, & Parker, 2006). And during early childhood children's interactions with peers become more coordinated and involve longer turns and sequences (Coplan & Arbeau, 2009).

Friends In early childhood, children distinguish between friends and nonfriends (Howes, 2009). For most young children, a friend is someone to play with. Young preschool children are more likely than older children to have friends who are of different gender and ethnicity (Howes, 2009).

The Connected Worlds of Parent-Child and Peer Relations Parents may influence their children's peer relations in many ways, both directly and indirectly (Booth-LaForce & Kerns, 2009; Ross & Howe, 2009). Parents affect such relations through their interactions with their children, how they manage their children's lives, and the opportunities they provide their children. A recent study revealed that warmth, advice giving, and a provision of opportunities by mothers and fathers were linked to children's social competence (high prosocial behavior, low aggression), and subsequently to social acceptance (being well liked by peers and teachers) one year later (McDowell & Parke, 2009).

Basic lifestyle decisions by parents—their choices of neighborhoods, churches, schools, and their own friends—largely determine the pool from which their children select possible friends. These choices in turn affect which children their children meet, their purpose in interacting, and eventually which children become their friends.

developmental **connection**

Peers. Children's peer relations have been classified in terms of five peer statuses. Chapter 10, p. 332

Researchers also have found that children's peer relations are linked to attachment security and parents' marital quality (Booth-LaForce & Kerns, 2009; Ross & Howe, 2009). Early attachments to caregivers provide a connection to children's peer relations not only by creating a secure base for children to explore social relationships beyond the family but also by conveying a working model of relationships (Hartup, 2009).

Do these results indicate that children's peer relations always are wedded to parent-child relationships? Although parent-child relationships influence children's subsequent peer relations, children also learn other modes of relating through their relationships with peers. For example, rough-and-tumble play occurs mainly with other children, not in parent-child interaction. In times of stress, children often turn to parents, not peers, for support. In parent-child relationships, children learn how to relate to authority figures. With their peers, children are likely to interact on a much more equal basis and to learn a mode of relating based on mutual influence. We will have much more to say about peer relations in Chapter 10, "Socioemotional Development in Middle and Late Childhood."

PLAY

An extensive amount of peer interaction during childhood involves play, but social play is only one type of play. *Play* is a pleasurable activity in which children engage for its own sake, and its functions and forms vary.

Let us play, for it is yet day
And we cannot go to sleep;
Besides, in the sky the little birds fly
And the hills are all covered with sheep.

—William Blake
English Poet, 19th Century

Play's Functions Play makes important contributions to young children's cognitive and socioemotional development (Coplan & Arbeau, 2009). Theorists have focused on different aspects of play and highlighted a long list of functions.

According to Freud and Erikson, play helps children master anxieties and conflicts. Because tensions are relieved in play, children can cope with life's problems. Play permits children to work off excess physical energy and to release pent-up tensions. Therapists use *play therapy* both to allow children to work off frustrations and to analyze children's conflicts and ways of coping with them (Sanders, 2008). Children may feel less threatened and be more likely to express their true feelings in the context of play.

Play also is an important context for cognitive development (Coplan & Arbeau, 2009). Both Piaget and Vygotsky concluded that play is a child's work. Piaget (1962) maintained that play advances children's cognitive development. At the same time, he said that children's cognitive development *constrains* the way they play. Play permits children to practice their competencies and acquired skills in a relaxed, pleasurable way. Piaget thought that cognitive structures need to be exercised, and play provides the perfect setting for this exercise.

Vygotsky (1962) also considered play to be an excellent setting for cognitive development. He was especially interested in the symbolic and make-believe aspects of play, as when a child substitutes a stick for a horse and rides the stick as if it were a horse. For young children, the imaginary situation is real. Parents should encourage such imaginary play, because it advances the child's cognitive development, especially creative thought.

Daniel Berlyne (1960) described play as exciting and pleasurable in itself because it satisfies our exploratory drive. This drive involves curiosity and a desire for information about something new or unusual. Play encourages exploratory behavior by offering children the possibilities of novelty, complexity, uncertainty, surprise, and incongruity.

More recently, play has been described as an important context for the development of language and communication skills (Coplan & Arbeau, 2009). Language and communication skills may be enhanced through discussions and negotiations regarding roles and rules in play as young children practice various words and phrases. These types of social interactions during play can benefit young children's literacy skills (Coplan & Arbeau, 2009). And, as we saw in Chapter 7, play is a central focus of the child-centered kindergarten and is thought to be an essential aspect of early childhood education (Feeney & others, 2010).

developmental **connection**

Cognitive Therapy. Vygotsky emphasized that children mainly develop their ways of thinking and understanding through social interaction. Chapter 7, p. 220

And that park grew
up with me; that small
world widened as I learned
its secrets and boundaries, as
I discovered new refuges in its
woods and jungles: hidden
homes and lairs for the multitudes
of imagination, for cowboys and
Indians. . . . I used to dawdle on half
holidays along the bent and
Devonfacing seashore, hoping for
gold watches or the skull of a
sheep or a message in a
bottle to be washed up
with the tide.

—DYLAN THOMAS
Welsh Poet, 20th Century

Types of Play The contemporary perspective on play emphasizes both the cognitive and the social aspects of play (Sumaroka & Bornstein, 2008). Among the most widely studied types of children's play today are sensorimotor and practice play, pretense/symbolic play, social play, constructive play, and games (Bergen, 1988).

Sensorimotor and Practice Play **Sensorimotor play** is behavior by infants to derive pleasure from exercising their sensorimotor schemes. The development of sensorimotor play follows Piaget's description of sensorimotor thought, which we discussed in Chapter 5. Infants initially engage in exploratory and playful visual and motor transactions in the second quarter of the first year of life. For example, at 9 months of age, infants begin to select novel objects for exploration and play, especially responsive objects, such as toys that make noise or bounce.

Practice play involves the repetition of behavior when new skills are being learned or when physical or mental mastery and coordination of skills are required for games or sports. Sensorimotor play, which often involves practice play, is primarily confined to infancy, whereas practice play can be engaged in throughout life. During the preschool years, children often engage in practice play.

Pretense/Symbolic Play **Pretense/symbolic play** occurs when the child transforms the physical environment into a symbol. Between 9 and 30 months of age, children increase their use of objects in symbolic play. They learn to transform objects—substituting them for other objects and acting toward them as if they were these other objects. For example, a preschool child treats a table as if it were a car and says, "I'm fixing the car," as he grabs a leg of the table.

sensorimotor play Behavior engaged in by infants to derive pleasure from exercising their existing sensorimotor schemas.

practice play Play that involves repetition of behavior when new skills are being learned or when physical or mental mastery and coordination of skills are required for games or sports.

pretense/symbolic play Play in which the child transforms the physical environment into a symbol.

A preschool "superhero" at play.

Many experts on play consider the preschool years the "golden age" of symbolic/pretense play that is dramatic or sociodramatic in nature. This type of make-believe play often appears at about 18 months of age and reaches a peak at 4 to 5 years of age, then gradually declines.

Some child psychologists conclude that pretend play is an important aspect of young children's development and often reflects advances in their cognitive development, especially as an indication of symbolic understanding. For example, Catherine Garvey (2000) and Angeline Lillard (2006) emphasize that hidden in young children's pretend play narratives are remarkable capacities for role-taking, balancing of social roles, metacognition (thinking about thinking), testing of the reality-pretense distinction, and numerous nonegocentric capacities that reveal the remarkable cognitive skills of young children. In one recent analysis, a major accomplishment in early childhood is the development of children's ability to share their pretend play with peers (Coplan & Arbeau, 2009). And in recent research pretend play has been found to contribute to young children's self-regulation, mainly because of the self-monitoring and social sensitivity that is required in creating and enacting a sociodramatic narrative in cooperation with other children (Diamond & others, 2007).

Social Play **Social play** is play that involves interaction with peers. Social play increases dramatically during the preschool years. For many children, social play is the main context for young children's social interactions with peers (Coplan & Arbeau, 2009). Social play includes varied interchanges such as turn taking, conversations about numerous topics, social games and routines, and physical play (Sumaroka & Bornstein, 2008). It also often involves a high degree of pleasure on the part of the participants (Sumaroka & Bornstein, 2008).

Constructive Play **Constructive play** combines sensorimotor/practice play with symbolic representation. It occurs when children engage in the self-regulated creation of a product or a solution. Constructive play increases in the preschool years as symbolic play increases and sensorimotor play decreases. It also becomes a frequent form of play in the elementary school years, both in and out of the classroom.

What characterizes social play?

social play Play that involves social interactions with peers.

constructive play Play that combines sensorimotor and repetitive activity with symbolic representation of ideas. Constructive play occurs when children engage in self-regulated creation or construction of a product or a solution.

Games **Games** are activities that children engage in for pleasure and that have rules. Often they involve competition. Preschool children may begin to participate in social games that involve simple rules of reciprocity and turn taking. However, games take on a much stronger role in the lives of elementary school children. In one study, the highest incidence of game playing occurred between 10 and 12 years of age (Eiferman, 1971). After age 12, games decline in popularity (Bergen, 1988).

SCHOOL OFFICE
my family
Campbell

"Mrs. Horton, could you stop by school today?"
© Martha F. Campbell.

TELEVISION

Few developments in society in the second half of the 20th century had a greater impact on children than television (Bickham, 2009). Although it is only one of the many types of mass media that affect children's behavior, television is the most influential. The persuasive capabilities of television are staggering (Scharrer & Demers, 2009).

Many children spend more time in front of the television set than they do with their parents. Just how much television do young children watch? Surveys vary, with the figures ranging from an average of two to four hours a day (Roberts & Foehr, 2008). Compared with their counterparts in other developed countries, children in the United States watch television for considerably longer periods. Television can have a negative influence on children by making them passive learners, distracting them from doing homework, teaching them stereotypes, providing them with violent models of aggression, and presenting them with unrealistic views of the world (Murray & Murray, 2008). However, television can have a positive influence on children's development by presenting motivating educational programs, increasing their information about the world beyond their immediate environment, and providing models of prosocial behavior (Wilson, 2008).

Effects of Television on Children's Aggression The extent to which children are exposed to violence and aggression on television raises special concerns (Gentile, Mathieson, & Crick, 2010; Scharrer & Demers, 2009). For example, Saturday morning cartoon shows average more than 25 violent acts per hour. In one experiment, preschool children were randomly assigned to one of two groups: One group watched television shows taken directly from violent Saturday morning cartoons on 11 days; the second group watched television cartoon shows with all of the violence removed (Steur, Applefield, & Smith, 1971). The children were then observed during play at their preschool. The preschool children who had seen the TV cartoon shows with violence kicked, choked, and pushed their playmates more than did the preschool children who watched nonviolent TV cartoon shows. Because the children were randomly assigned to the two conditions (TV cartoons with violence versus nonviolent TV cartoons), we can conclude that exposure to TV violence *caused* the increased aggression in the children in this investigation.

How is television violence linked to children's aggression?

Other research has found links between watching television violence as a child and acting aggressively years later. For example, in one study, exposure to media violence at 6 to 10 years of age was linked with young adult aggressive behavior (Huesmann & others, 2003).

In addition to television violence, there is increased concern about children who play violent video games, especially those that are highly realistic (Escobar-Chaves & Anderson, 2008). Recent research reviews have concluded that playing violent video games is linked to aggression in both males and females (Anderson, Gentile, & Buckley, 2007; Carnagey, Anderson, & Bushman, 2007).

Effects of Television on Children's Prosocial Behavior Television also can teach children that it is better to behave in positive, prosocial ways than in negative, antisocial ways (Bryant, 2007). Researchers have found that when children watch positive social interchanges in which children are taught how to use social skills on the TV show *Sesame Street,* they subsequently are likely to imitate these positive social behaviors (Bryant, 2007).

games Activities engaged in for pleasure that include rules and often competition with one or more individuals.

Review *Connect* Reflect

LG3 Describe the roles of peers, play, and television in young children's development.

Review

- How do peers affect young children's development?
- What are some theories and types of play?
- How does television influence young children's development?

Connect

- Earlier in this chapter, you learned about Laurie Kramer's program for teaching siblings social skills to develop positive interactions. Do you think her recommendations would be relevant or irrelevant to peer relationships? Why?

Reflect *Your Own Personal Journey of Life*

- What guidelines would you adopt for your own children's television viewing?

topical **connections**

The middle and late childhood years bring further changes in children's socioemotional development. Development of self-understanding and understanding others becomes more sophisticated, emotional understanding improves, and moral reasoning advances. Children now spend less time with parents, but parents still play very important roles in children's lives, especially in guiding their academic achievement and managing their opportunities. Peer status and friendship become more important in children's peer relations and school takes on a stronger academic focus.

looking ***forward***

reach your **learning goals**

1 Emotional and Personality Development

LG1 Discuss emotional and personality development in early childhood.

The Self

- In Erikson's theory, early childhood is a period when development involves resolving the conflict of initiative versus guilt. The toddler's rudimentary self-understanding develops into the preschooler's representation of the self in terms of body parts, material possessions, and physical activities. At about 4 to 5 years of age, children also begin to use trait-like self-descriptions. Young children display more sophisticated self-understanding and understanding of others than previously thought.

Emotional Development

- Advances in young children's emotions involve expressing emotions, understanding emotions, and regulating emotions. Young children's range of emotions expands during early childhood as they increasingly experience self-conscious emotions such as pride, shame, and guilt. Between 2 and 4 years old, children use an increasing number of terms to describe emotion and learn more about the causes and consequences of feelings. At 4 to 5 years of age, children show an increased ability to reflect on emotions and understand that a single event can elicit different emotions in different people. They also show a growing awareness of the need to manage emotions to meet social standards. Emotion-coaching parents have children who engage in more effective self-regulation of their emotions than do emotion-dismissing parents. Emotional regulation plays an important role in successful peer relations.

Moral Development

- Moral development involves thoughts, feelings, and behaviors regarding rules and conventions about what people should do in their interactions with others. Freud's psychoanalytic theory emphasizes the importance of feelings in the development of the superego, the moral branch of personality. Positive emotions, such as empathy, also contribute to the child's moral development. Piaget analyzed moral reasoning and concluded that children from about 4 to 7 years of age display heteronomous morality, judging behavior by its consequences; then, at about 10 years of age and older, they develop autonomous morality. According to behavioral and social cognitive theorists, moral behavior develops as a result of reinforcement, punishment and imitation, and there is considerable situational variability in moral behavior. Conscience refers to an internal regulation of standards of right and wrong that involves an integration of moral thought, feeling, and behavior. Young children's conscience emerges out of relationships with parents. Parents influence young children's moral development through the quality of parent-child relationships, through being proactive in helping children avert misbehavior, and through engaging children in conversational dialogue about moral issues.

Gender

- Gender refers to the social and psychological dimensions of being male or female. Gender identity is acquired by 2½ years of age for most children. A gender role is a set of expectations that prescribes how females or males should think, act, and feel. Gender typing refers to the acquisition of a traditional masculine or feminine role. Biological influences on gender development include chromosomes and hormones. However, biology is not completely destiny in gender development; children's socialization experiences matter a great deal. Social role theory, psychoanalytic theory, and social cognitive theory emphasize various aspects of social experiences in the development of gender characteristics. Parents influence children's gender development, and peers are especially adept at rewarding gender-appropriate behavior. Gender schema theory emphasizes the role of cognition in gender development.

2 Families

LG2 Explain how families can influence young children's development.

Parenting

- Authoritarian, authoritative, neglectful, and indulgent are four main parenting styles. Authoritative parenting is the most widely used style around the world and is the style most often associated with children's social competence. However, ethnic variations in parenting styles suggest that in Asian American families, some aspects of control may benefit children. Physical punishment is widely used by U.S. parents but some experts conclude that there are a number of reasons it should not be used with children. However, there currently is controversy about the effects of physical punishment on children with few studies making a distinction between abusive and mild physical punishment. Coparenting has positive effects on children's development.

Child Maltreatment

- Child maltreatment may take the form of physical abuse, child neglect, sexual abuse, and emotional abuse. Child maltreatment places the child at risk for academic, emotional, and social problems. Adults who suffered child maltreatment are also vulnerable to a range of problems.

Sibling Relationships and Birth Order

- Siblings interact with each other in positive and negative ways. Birth order is related in certain ways to personality characteristics—for example, firstborns are more adult-oriented and self-controlled. Only children often are achievement-oriented. By itself, however, birth order it is not a good predictor of behavior.

The Changing Family in a Changing Society

- In general, having both parents employed full-time outside the home has not been shown to have negative effects on children. However, the nature of parents' work can affect their parenting quality. Divorce can have negative effects on children's adjustment, but so can an acrimonious relationship between parents who stay together for their children's sake. If divorced parents develop a harmonious relationship and practice authoritative parenting, children's adjustment improves. Researchers have found few differences between children growing up in gay or lesbian families and children growing up in heterosexual families. Cultures vary on a number of issues regarding families. African American and Latino children are more likely than White American children to live in single-parent families and larger families and to have extended family connections. Low-income families have less access to resources than higher-income families. Lower-SES parents create a home atmosphere that involves more authority and physical punishment with children than higher-SES parents. Higher-SES parents are more concerned about developing children's initiative and delay of gratification.

3 Peer Relations, Play, and Television

LG3 Describe the roles of peers, play, and television in young children's development.

Peer Relations

- Peers are powerful socialization agents. Peers provide a source of information and comparison about the world outside the family. In early childhood, children distinguish between friends and nonfriends with a friend often described as someone to play with. Parent-child and peer relationships are often connected. Parents influence their children's peer relations by how they manage children's lives and their opportunities for interacting with peers. Rough-and-tumble play is more likely to occur in peer relations whereas in times of stress children often turn to parents rather than peers for support.

Play

- Play's functions include affiliation with peers, tension release, advances in cognitive development, exploration, and provision of a safe haven. The contemporary perspective on play emphasizes both the cognitive and the social aspects of play. Among the most widely studied types of children's play are sensorimotor play, practice play, pretense/symbolic play, social play, constructive play, and games.

Television

- Television can have both negative influences (such as turning children into passive learners and presenting them with aggressive models) and positive influences (such as providing models of prosocial behavior) on children's development. Both watching TV violence and playing violent videogames have been linked to children's aggressive behavior. Prosocial behavior on TV can teach children positive behavior.

key terms

self-understanding 243
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section **five**

Every forward step we take we leave some phantom of ourselves behind.

—John Lancaster Spalding
American Educator, 19th Century

Middle and Late Childhood

In middle and late childhood, children are on a different plane, belonging to a generation and feeling all their own. It is the wisdom of the human life span that at no time are children more ready to learn than during the period of expansive imagination at the end of early childhood. Children develop a sense of wanting to make things—and not just to make them, but to make them well and even perfectly. They seek to know and to understand. They are remarkable for their intelligence and for their curiosity. Their parents continue to be important influences in their lives, but their growth also is shaped by peers and friends. They don't think much about the future or about the past, but they enjoy the present moment. Section 5 consists of two chapters: "Physical and Cognitive Development in Middle and Late Childhood" (Chapter 9) and "Socioemotional Development in Middle and Late Childhood" Chapter 10).

chapter 9

PHYSICAL AND COGNITIVE DEVELOPMENT IN MIDDLE AND LATE CHILDHOOD

chapter **outline**

1 Physical Changes and Health

Learning Goal 1 Describe physical changes and health in middle and late childhood.

Body Growth and Change
The Brain
Motor Development
Exercise
Health, Illness, and Disease

2 Children With Disabilities

Learning Goal 2 Identify children with different types of disabilities and issues in educating them.

The Scope of Disabilities
Educational Issues

3 Cognitive Changes

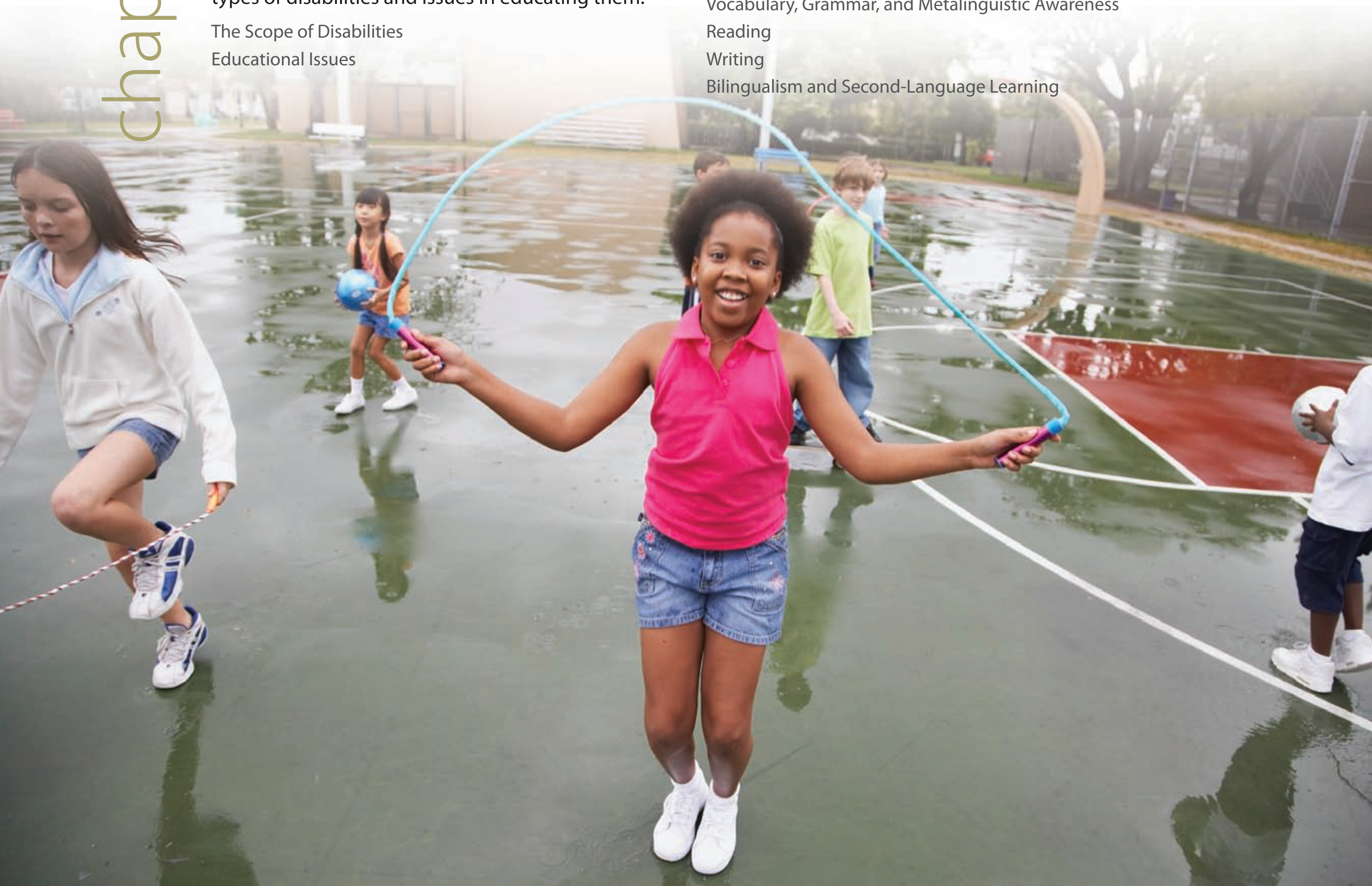
Learning Goal 3 Explain cognitive changes in middle and late childhood.

Piaget's Cognitive Developmental Theory
Information Processing
Intelligence
Extremes of Intelligence

4 Language Development

Learning Goal 4 Discuss language development in middle and late childhood.

Vocabulary, Grammar, and Metalinguistic Awareness
Reading
Writing
Bilingualism and Second-Language Learning



The following comments are by Angie, an elementary-school-aged girl:

> When I was eight years old, I weighed 125 pounds. My clothes were the size that large teenage girls wear. I hated my body and my classmates teased me all the time. I was so overweight and out of shape that when I took a P.E. class my face would get red and I had trouble breathing. I was jealous of the kids who played sports and weren't overweight like I was.
>
> I'm nine years old now and I've lost 30 pounds. I'm much happier and proud of myself. How did I lose the weight? My mom said she had finally decided enough was enough. She took me to a pediatrician who specializes in helping children lose weight and keep it off. The pediatrician counseled my mom about my eating and exercise habits, then had us join a group that he had created for overweight children and their parents. My mom and I go to the group once a week and we've now been participating in the program for six months. I no longer eat fast food meals and my mom is cooking more healthy meals. Now that I've lost weight, exercise is not as hard for me and I don't get teased by the kids at school. My mom's pretty happy too because she's lost 15 pounds herself since we've been in the counseling program.

Not all overweight children are as successful as Angie at reducing their weight. Indeed, being overweight or obese in childhood has become a major national concern in the United States. Later in the chapter, we will further explore being overweight and obese in childhood, including obesity's causes and outcomes.

topical **connections**

Children grow more slowly in early childhood than in infancy, but they still grow an average of 2.5 inches and 4 to 7 pounds a year. In early childhood, the most rapid growth in the brain occurs in the prefrontal cortex. The gross and fine motor skills of children also become smoother and more coordinated. In terms of cognitive development, early childhood is a period in which young children increasingly engage in symbolic thought. Young children's information-processing skills also improve considerably—executive and sustained attention advance, short-term memory gets better, and their understanding of the human mind makes considerable progress. Young children also increase their knowledge of language's rule systems and their literacy benefits from being active participants in a wide range of language experiences. Most young children attend an early childhood education program, and there are many variations in these programs.

looking ***back***

preview

During the middle and late childhood years, children grow taller, heavier, and stronger. They become more adept at using their physical skills, and they develop new cognitive skills. This chapter is about physical and cognitive development in middle and late childhood. To begin, we will explore some changes in physical development.

1 Physical Changes and Health

LG1 Describe physical changes and health in middle and late childhood.

- Body Growth and Change
- The Brain
- Motor Development
- Exercise
- Health, Illness, and Disease

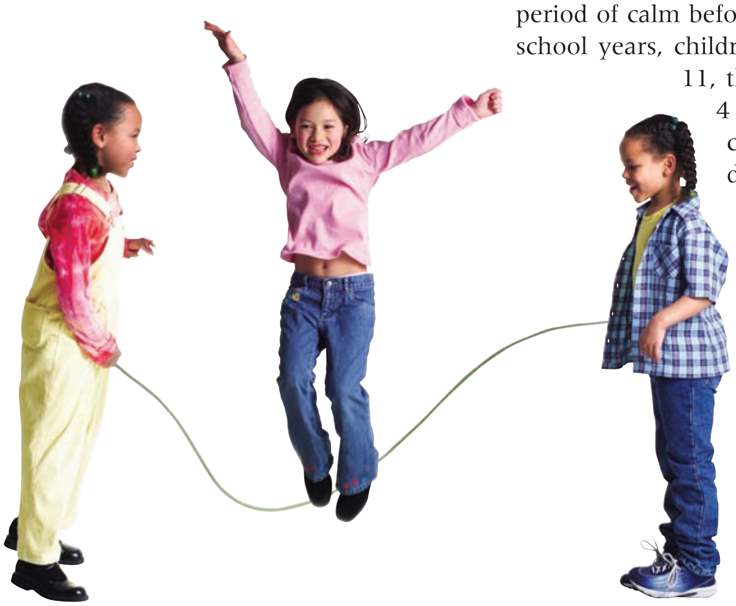
Continued change characterizes children's bodies during middle and late childhood, and their motor skills improve. As children move through the elementary school years, they gain greater control over their bodies and can sit and keep their attention focused for longer periods of time. Regular exercise is one key to making these years a time of healthy growth and development.

BODY GROWTH AND CHANGE

The period of middle and late childhood involves slow, consistent growth. This is a period of calm before the rapid growth spurt of adolescence. During the elementary school years, children grow an average of 2 to 3 inches a year until, at the age of 11, the average girl is 4 feet, 10¼ inches tall, and the average boy is 4 feet, 9 inches tall. During the middle and late childhood years, children gain about 5 to 7 pounds a year. The weight increase is due mainly to increases in the size of the skeletal and muscular systems, as well as the size of some body organs.

Proportional changes are among the most pronounced physical changes in middle and late childhood. Head circumference and waist circumference decrease in relation to body height (Hockenberry & Wilson, 2009). A less noticeable physical change is that bones continue to ossify during middle and late childhood but yield to pressure and pull more than mature bones.

Muscle mass and strength gradually increase during these years as "baby fat" decreases. The loose movements and knock-knees of early childhood give way to improved muscle tone. Thanks to both heredity and to exercise, children double their strength capabilities during these years. Because of their greater number of muscle cells, boys are usually stronger than girls.



What characterizes children's physical growth in middle and late childhood?

THE BRAIN

The development of brain-imaging techniques, such as magnetic resonance imaging (MRI), has led to an increase in research on changes in the brain during middle and late childhood, and how these brain changes are linked to improvements in cognitive development (Diamond, 2009; Diamond, Casey, & Munakata, 2011). Total brain volume stabilizes by the end of middle and late childhood, but significant changes in various structures and regions of the brain continue to occur. In particular, the brain pathways and circuitry involving the prefrontal cortex, the highest level in the brain, continue to increase in middle and late childhood (Durston & Casey, 2006) (see

Figure 9.1). These advances in the prefrontal cortex are linked to children's improved attention, reasoning, and cognitive control (Crone & others, 2009).

Leading developmental neuroscientist Mark Johnson and his colleagues (2009) recently proposed that the prefrontal cortex likely orchestrates the functions of many other brain regions during development. As part of this neural leadership, organizational role, the prefrontal cortex may provide an advantage to neural networks and connections that include the prefrontal cortex. In their view, the prefrontal cortex coordinates the best neural connections for solving a problem at hand.

Changes also occur in the thickness of the cerebral cortex (cortical thickness) in middle and late childhood (Gogtay & Thompson, 2010; Toga, Thompson, & Sowell, 2006). One study used brain scans to assess cortical thickness in 5- to 11-year-old children (Sowell & others, 2004). Cortical thickening across a two-year time period was observed in the temporal and frontal lobe areas that function in language, which may reflect improvements in language abilities such as reading. Figure 4.4 in Chapter 4 shows the locations of the temporal and frontal lobes in the brain.

As children develop, activation of some brain areas increases while others decrease (Diamond, Casey, & Munakata, 2011; Nelson, 2011). One shift in activation that occurs as children develop is from diffuse, larger areas to more focal, smaller areas (Turkeltaub & others, 2003). This shift is characterized by synaptic pruning, in which areas of the brain not being used lose synaptic connections and those being used show an increase in connections. In a recent study, researchers found less diffusion and more focal activation in the prefrontal cortex from 7 to 30 years of age (Durston & others, 2006). The activation change was accompanied by increased efficiency in cognitive performance, especially in *cognitive control*, which involves flexible and effective control in a number of areas. These areas include controlling attention, reducing interfering thoughts, inhibiting motor actions, and being flexible in switching between competing choices (Diamond, Casey, & Munakata, 2011).

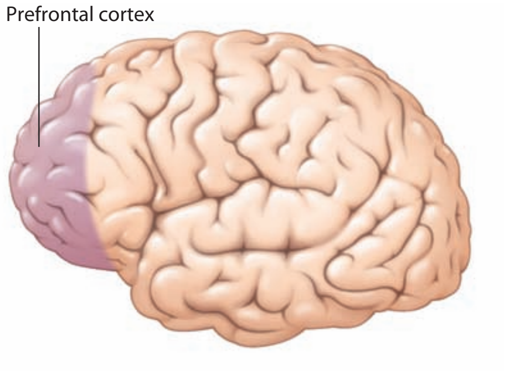


FIGURE **9.1**

THE PREFRONTAL CORTEX. The brain pathways and circuitry involving the prefrontal cortex (shaded in purple) show significant advances in development during middle and late childhood. *What cognitive processes are these changes in the prefrontal cortex linked to?*

developmental **connection**

Brain Development. Synaptic pruning is an important aspect of the brain's development and the pruning varies by brain region across children's development. Chapter 4, p. 115

MOTOR DEVELOPMENT

During middle and late childhood, children's motor skills become much smoother and more coordinated than they were in early childhood. For example, only one child in a thousand can hit a tennis ball over the net at the age of 3, yet by the age of 10 or 11 most children can learn to play the sport. Running, climbing, skipping rope, swimming, bicycle riding, and skating are just a few of the many physical skills elementary school children can master. In gross motor skills involving large muscle activity, boys usually outperform girls.

Increased myelination of the central nervous system is reflected in the improvement of fine motor skills during middle and late childhood. Children can more adroitly use their hands as tools. Six-year-olds can hammer, paste, tie shoes, and fasten clothes. By 7 years of age, children's hands have become steadier. At this age, children prefer a pencil to a crayon for printing, and reversal of letters is less common. Printing becomes smaller. At 8 to 10 years of age, the hands can be used independently with more ease and precision. Fine motor coordination develops to the point at which children can write rather than print words. Cursive letter size becomes smaller and more even. At 10 to 12 years of age, children begin to show manipulative skills similar to the abilities of adults. They can master the complex, intricate, and rapid movements needed to produce fine-quality crafts or to play a difficult piece on a musical instrument. Girls usually outperform boys in their use of fine motor skills.

EXERCISE

Elementary school children are far from physical maturity, so they need to be active (Graham, Holt/Hale, & Parker, 2010; Rink, 2009). They become more fatigued by long periods of sitting than by running, jumping, or bicycling. Physical action, such as batting a ball, skipping rope, or balancing on a beam, is essential for these children to refine their developing skills. It is becoming increasingly clear that exercise plays an important role in children's growth and development (Fahey, Insel, & Roth, 2011).

Are U.S. children getting enough exercise? In one historical comparison, the percentage of children involved in daily P.E. programs in schools decreased from 80 percent in 1969 to 20 percent in 1999 (Health Management Resources, 2001) (see Figure 9.2). Educators and policy makers in many other countries around the world, including China, Finland, and Great Britain, have become very concerned about the sedentary lifestyles of many children in their countries (Fogelholm, 2008).

Television watching is linked with low activity and obesity in children (Wells & others, 2008). A related concern is the dramatic increase in computer use by children. Researchers have found that the total time that children and adolescents spend in front of a television or computer screen places them at risk for reduced activity and being overweight (Rey-Lopez & others, 2008).

Increasing children's exercise levels has positive outcomes. A recent study found that 45 minutes of moderate physical activity and 15 minutes of vigorous physical activity daily were related to decreased odds of children being overweight (Wittmeier, Mollard, & Kriellaars, 2008).

Parents and schools play important roles in children's exercise levels (Fahey, Insel, & Roth, 2011). Growing up with parents who exercise regularly provides positive models of exercise for children (Crawford & others, 2010; Loprinzi & Trost, 2010). A recent study revealed that mothers were more likely then fathers to limit sedentary behavior in boys and girls (Edwardson & Gorely, 2010). In this study, fathers did have an influence on their sons' physical activity, but primarily through explicit modeling of physical activity, such as showing their sons how to shoot a basketball. Another recent study found that a school-based physical activity was successful in improving children's fitness and lowering their fat content (Kriemler & others, 2010).

Researchers also are finding that exercise is linked to children's cognitive development. For example, a recent research study revealed that aerobic exercise was linked to increases in an important cognitive activity—planning—in overweight 9-year-old children (Davis & others, 2007). In another recent study, 9-year-old girls who were more physically fit (as measured on a field test of aerobic capacity) showed better cognitive performance on a cognitive control task that involved inhibiting task-irrelevant information to obtain correct solutions than 9-year-old girls who were less physically fit (Hillman & others, 2009).

Here are some ways to get children to exercise more:

- Offer more physical activity programs run by volunteers at school facilities.
- Improve physical fitness activities in schools.
- Have children plan community and school activities that really interest them.
- Encourage families to focus more on physical activity, and encourage parents to exercise more.

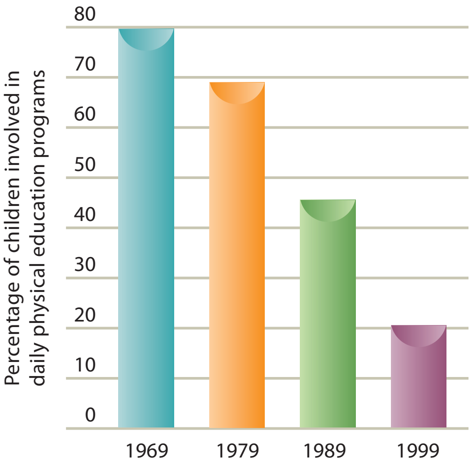


FIGURE **9.2**

PERCENTAGE OF CHILDREN INVOLVED IN DAILY PHYSICAL EDUCATION PROGRAMS IN THE UNITED STATES FROM 1969 TO 1999. There has been a dramatic drop in the percentage of children participating in daily physical education programs in the United States, from 80 percent in 1969 to only 20 percent in 1999.

What are some good strategies for increasing children's exercise?

HEALTH, ILLNESS, AND DISEASE

For the most part, middle and late childhood is a time of excellent health. Disease and death are less prevalent at this time than during other periods in childhood and in adolescence. However, many children in middle and late childhood face health problems that harm their development (Nyaronga & Wickrama, 2009).

Accidents and Injuries Injuries are the leading cause of death during middle and late childhood, and the most common cause of severe injury and death in this period is motor vehicle accidents, either as a pedestrian or as a passenger (Frisbie, Hummer, & McKinnon, 2009). For this reason, safety advocates recommend the use of safety-belt restraints in vehicles because they can greatly reduce the severity of motor vehicle injuries. Other serious injuries involve bicycles, skateboards, roller skates, and other sports equipment.

Overweight Children Being overweight is an increasing child health problem (Blake, 2011; Schiff, 2011). Recall from Chapter 7, "Physical and Cognitive Development in Early Childhood," that being overweight is defined in terms of body mass index (BMI), which is computed by a formula that takes into account height and weight—children at or above the 97th percentile are included in the obesity category, at or above the 95th percentile in the overweight category, and children at or above the 85th percentile are described as at risk for being overweight (Centers for Disease Control and Prevention, 2010). Over the last three decades, the percentage of U.S. children who are at risk for being overweight has doubled from 15 percent in the 1970s to almost 30 percent today, and the percentage of children who are overweight has tripled during this time frame (Paxson & others, 2006). Recently, however, the increase in child obesity began to level off. A large-scale U.S. study revealed that using the criteria for obesity just stated, child obesity increased from 7 percent to 11 percent from 1980 to 1994 but was essentially the same from 2002 (16 percent) to 2006 (17 percent) (Odgen, Carroll, & Flegal, 2008).

What are some concerns about the increase in overweight and obese children?

Still, the levels of child obesity, overweight, and risk for being overweight are still far too high (Donatelle, 2011). Note that girls are more likely than boys to be overweight, and this gender difference occurs in many countries (Sweeting, 2008). In a recent large-scale U.S. study, African American and Latino children were more likely to be overweight or obese than non-Latino White children (Benson, Baer, & Kaelber, 2009).

The increase in overweight children in recent decades is cause for great concern because being overweight raises the risk for many medical and psychological problems (Oliver & others, 2010; Raghuveer, 2010). Overweight children are at risk for developing pulmonary problems, such as sleep apnea (which involves upper-airway obstruction), and hip problems (Goodwin & others, 2010). Diabetes, hypertension (high blood pressure), and elevated blood cholesterol levels also are common in children who are overweight (Amed & others, 2010; Genovesi & others, 2010; Viikari & others, 2009). A recent research review concluded that obesity was linked with low self-esteem in children (Griffiths, Parsons, & Hill, 2010).

developmental **connection**

Conditions, Diseases, and Disorders. Metabolic syndrome has increased in middle-aged adults in recent years and is linked to early death. Chapter 15, p. 480

Cardiovascular Disease Cardiovascular disease is uncommon in children. Nonetheless, environmental experiences and behavior in the childhood years can sow the seeds for cardiovascular disease in adulthood. Many elementary-school-aged children already possess one or more of the risk factors for cardiovascular disease, such as hypertension and obesity (Jago & others, 2010). A recent national study found that an increasing percentage of U.S. children and adolescents had elevated blood pressure from 1988 to 2006 (Ostchega & others, 2009). In this study, children who were obese were more likely to have elevated blood pressure. Further, a recent study revealed that high blood pressure goes undiagnosed in 75 percent of children with the disease (Hansen, Gunn, & Kaelber, 2007). A recent study also found that children with a high body mass index and waist circumference are at risk for *metabolic syndrome*—a constellation of factors, including obesity, high blood pressure, and type 2 diabetes—placing individuals at risk for developing cardiovascular disease in adulthood (Sun & others, 2008).

Cancer Cancer is the second leading cause of death in U.S. children 5 to 14 years of age. One in every 330 children in the United States develops cancer before the age of 19. The incidence of cancer in children has slightly increased in recent years (National Cancer Institute, 2008a).

Child cancers mainly attack the white blood cells (leukemia), brain, bone, lymph system, muscles, kidneys, and nervous system. All are characterized by an uncontrolled proliferation of abnormal cells (Hijiya & others, 2007). As indicated in Figure 9.3, the most common cancer in children is leukemia, a cancer in which bone marrow manufactures an abundance of abnormal white blood cells, which crowd out normal cells, making the child susceptible to bruising and infection (Eden, 2010; Kaatsch, 2010).

Because of advancements in cancer treatment, children with cancer are surviving longer (National Cancer Institute, 2008b). For example, in the 1960s less than 5 percent

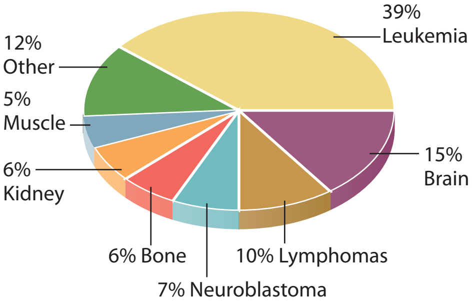


FIGURE **9.3**

TYPES OF CANCER IN CHILDREN. Cancers in children have a different profile from adult cancers, which attack mainly the lungs, colon, breast, prostate, and pancreas.

connecting with careers

Sharon McLeod, Child Life Specialist

Sharon McLeod is a child life specialist who is senior clinical director in the Division of Child Life and Division of Integrative Care at the Children's Hospital Medical Center in Cincinnati.

Under McLeod's direction, the goals of her department are to promote children's optimal growth and development, reduce the stress of health care experiences, and provide support to child patients and their families. These goals are accomplished through therapeutic play and developmentally appropriate activities, educating and psychologically preparing children for medical procedures, and serving as a resource for parents and other professionals regarding children's development and health care issues.

McLeod says that human growth and development provides the foundation for her profession as child life specialist. She also says her best times as a student were when she conducted fieldwork, had an internship, and experienced hands-on theories and concepts that she learned in her courses.

Sharon McLeod, child life specialist, working with a child at Children's Hospital Medical Center in Cincinnati.

For more information about what child life specialists do, see page 48 in the Careers in Life-Span Development appendix.

of children with an acute form of leukemia survived for more than five years; today, approximately 25 percent of these children survive for five years or more.

Child life specialists are among the health professionals who work to make the lives of children with diseases less stressful. To read about the work of child life specialist Sharon McCleod, see *Connecting With Careers*.

Review *Connect* Reflect

LG1 Describe physical changes and health in middle and late childhood.

Review

- What are some changes in body growth and proportion in middle and late childhood?
- What characterizes the development of the brain in middle and late childhood?
- How do children's motor skills develop in middle and late childhood?
- What role does exercise play in children's lives?
- What are some characteristics of health, illness, and disease in middle and late childhood?

Connect

- In this section, you learned that increased myelination of the central nervous system is reflected in the improvement of fine motor skills during middle and late childhood. What developmental advances were connected with increased myelination in infancy and early childhood?

Reflect *Your Own Personal Journey of Life*

- One way that children get exercise is to play a sport. If you played a sport as a child, was it a positive or negative experience for you? Do you think that playing a sport as child likely made a difference in whether you continue to exercise on a regular basis today? Explain. If you did not play a sport, do you wish you had? Explain.

2 Children With Disabilities

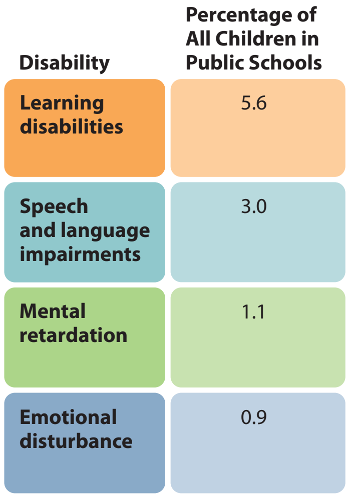
LG2 Identify children with different types of disabilities and issues in educating them.

- The Scope of Disabilities
- Educational Issues

What are some of the disabilities that children have? What characterizes the education of children with disabilities?

THE SCOPE OF DISABILITIES

Approximately 14 percent of all children from 3 to 21 years of age in the United States receive special education or related services (National Center for Education Statistics, 2008a). Figure 9.4 shows the four largest groups of students with a disability who were served by federal programs in the 2006–2007 school year (National Center for Education Statistics, 2008a). As indicated in Figure 9.4, students with a learning disability were by far the largest group of students with a disability to be given special education, followed by children with speech or language impairments, mental retardation, and emotional disturbance.



Disability	Percentage of All Children in Public Schools
Learning disabilities	5.6
Speech and language impairments	3.0
Mental retardation	1.1
Emotional disturbance	0.9

FIGURE **9.4**

U.S. CHILDREN WITH A DISABILITY WHO RECEIVE SPECIAL EDUCATION SERVICES. Figures are for the 2006–2007 school year and represent the four categories with the highest number and percentage of children. Both learning disability and attention deficit hyperactivity disorder are combined in the learning disabilities category (National Center for Education Statistics, 2008a).

Learning Disabilities

The U.S. government created a definition of learning disabilities in 1997 and then reauthorized the definition with a few minor changes in 2004. Following is a description of the government's definition of what determined whether a child should be classified as having a learning disability. A child with a **learning disability** has difficulty in learning that involves understanding or using spoken or written language, and the difficulty can appear in listening, thinking, reading, writing, and spelling. A learning disability also may involve difficulty in doing mathematics. To be classified as a learning disability, the learning problem is not primarily the result of visual, hearing, or motor disabilities; mental retardation; emotional disorders; or due to environmental, cultural, or economic disadvantage.

About three times as many boys as girls are classified as having a learning disability. Among the explanations for this gender difference are a greater biological vulnerability among boys and *referral bias.* That is, boys are more likely to be referred by teachers for treatment because of troublesome behavior.

Approximately 80 percent of children with a learning disability have a reading problem (Shaywitz, Gruen, & Shaywitz, 2007). Three types of learning disabilities are dyslexia, dysgraphia, and discalculia:

- **Dyslexia** is a category reserved for individuals who have a severe impairment in their ability to read and spell (Ise & Schulte-Korne, 2010).
- **Dysgraphia** is a learning disability that involves difficulty in handwriting (Rosenblum, Aloni, & Josman, 2010). Children with dysgraphia may write very slowly, their writing products may be virtually illegible, and they may make numerous spelling errors because of their inability to match up sounds and letters.
- **Dyscalculia**, also known as developmental arithmetic disorder, is a learning disability that involves difficulty in math computation (Rykhlevskaia & others, 2010).

The precise causes of learning disabilities have not yet been determined (Hallahan, Kauffman, & Pullen, 2009; Rosenberg, Westling, & McLesky, 2011). Researchers also use brain-imaging techniques, such as magnetic resonance imaging, to reveal any regions of the brain that might be involved in learning disabilities (Shaywitz, Lyon, & Shaywitz, 2006) (see Figure 9.5). This research indicates that it is unlikely learning disabilities reside in a single, specific brain location. More likely, learning disabilities are due to problems in integrating information from multiple brain regions or subtle difficulties in brain structures and functions.

learning disability Describes a child who has difficulty in learning that involves understanding or using spoken or written language, and the difficulty can appear in listening, thinking, reading, writing, and spelling. A learning disability also may involve difficulty in doing mathematics. To be classified as a learning disability, the learning problem is not primarily the result of visual, hearing, or motor disabilities; mental retardation; emotional disorders; or due to environmental, cultural, or economic disadvantage.

dyslexia A category of learning disabilities involving a severe impairment in the ability to read and spell.

dysgraphia A learning disability that involves difficulty in handwriting.

dyscalculia Also known as developmental arithmetic disorder; a learning disability that involves difficulty in math computation.

Interventions with children who have a learning disability often focus on improving reading ability (Bursuck & Damer, 2011). Intensive instruction over a period of time by a competent teacher can help many children (Berninger, 2006; Waber, 2010).

FIGURE **9.5**

BRAIN SCANS AND LEARNING DISABILITIES. An increasing number of studies are using MRI brain scans to examine the brain pathways involved in learning disabilities. Shown here is 9-year-old Patrick Price, who has dyslexia. Patrick is going through an MRI scanner disguised by drapes to look like a child-friendly castle. Inside the scanner, children must lie virtually motionless as words and symbols flash on a screen, and they are asked to identify them by clicking different buttons.

Attention Deficit Hyperactivity Disorder (ADHD) **Attention deficit hyperactivity disorder (ADHD)** is a disability in which children consistently show one or more of these characteristics over a period of time: (1) inattention, (2) hyperactivity, and (3) impulsivity. Children who are inattentive have such difficulty focusing on any one thing that they may get bored with a task after only a few minutes—or even seconds. Children who are hyperactive show high levels of physical activity, seeming to be almost constantly in motion. Children who are impulsive have difficulty curbing their reactions; they do not do a good job of thinking before they act. Depending on the characteristics that children with ADHD display, they can be diagnosed as (1) ADHD with predominantly inattention, (2) ADHD with predominantly hyperactivity/impulsivity, or (3) ADHD with both inattention and hyperactivity/impulsivity.

The number of children diagnosed and treated for ADHD has increased substantially in recent decades. The disorder occurs as much as four to nine times more in boys than in girls. There is controversy, however, about the increased diagnosis of ADHD (Stolzer, 2009). Some experts attribute the increase mainly to heightened awareness of the disorder; others are concerned that many children are being incorrectly diagnosed (Parens & Johnston, 2009).

Definitive causes of ADHD have not been found. However, a number of causes have been proposed (Faraone & Mick, 2010; Stolzer, 2009). Some children likely inherit a tendency to develop ADHD from their parents (Durston, 2010; Pennington & others, 2009). Other children likely develop ADHD because of damage to their brain during prenatal or postnatal development (Lindblad & Hjern, 2010). Among early possible contributors to ADHD are cigarette and alcohol exposure during prenatal development and low birth weight (Knopik, 2009).

As with learning disabilities, the development of brain-imaging techniques is leading to a better understanding of ADHD (Hoeksema & others, 2010). A recent study revealed that peak thickness of the cerebral cortex occurred three years later (10.5 years) in children with ADHD than in children without ADHD (peak at 7.5 years) (Shaw & others, 2007). The delay was more prominent in the prefrontal regions of the brain that especially are important in attention and planning (see Figure 9.6). Researchers also are exploring the roles that various neurotransmitters, such as serotonin and dopamine, might play in ADHD (Levy, 2009; Rondou, Haegeman, & Van Craenenbroeck, 2010; Zhou & others, 2010).

Stimulant medication such as Ritalin or Adderall (which has fewer side effects than Ritalin) is effective in improving the attention of many children with ADHD, but it usually does not improve their attention to the same level as children who do not have ADHD (Brams, Mao, & Doyle, 2009; Stray, Ellertsen, & Stray, 2010). A recent meta-analysis concluded that behavior management treatments are effective in reducing the effects of ADHD (Fabiano & others, 2009). Researchers have often found that a combination of medication (such as Ritalin) and behavior management improves the behavior of children with ADHD better than medication alone or behavior management alone, although not in all cases (Parens & Johnston, 2009).

Many children with ADHD show impulsive behavior, such as this child who is throwing a paper airplane at other children. *How would you handle this situation if you were a teacher and this were to happen in your classroom?*

attention deficit hyperactivity disorder (ADHD) A disability in which children consistently show one or more of the following characteristics: (1) inattention, (2) hyperactivity, and (3) impulsivity.

Emotional and Behavioral Disorders Most children have minor emotional difficulties sometime during their school years. A small percentage have problems so serious and persistent that they are classified as having an emotional or a behavioral disorder (Gargiulo, 2009; Kauffman & Landrum, 2009).

Emotional and behavioral disorders consist of serious, persistent problems that involve relationships, aggression, depression, and fears associated with personal or school matters, as well as other inappropriate socioemotional characteristics. Approximately 8 percent of children who have a disability and require an individualized education plan fall into this classification. Boys are three times as likely as girls to have these disorders.

Autism Spectrum Disorders **Autism spectrum disorders (ASD),** also called pervasive developmental disorders, range from the severe disorder labeled autistic disorder to the milder disorder called Asperger syndrome. Autism spectrum disorders are characterized by problems in social interaction, problems in verbal and nonverbal communication, and repetitive behaviors (Boutot & Myles, 2011; Hall, 2009). Children with these disorders may also show atypical responses to sensory experiences (National Institute of Mental Health, 2008). Mental retardation is present in some children with autism; others show average or above-average intelligence (Hoekstra & others, 2010). Autism spectrum disorders can often be detected in children as early as 1 to 3 years of age.

Recent estimates of autism spectrum disorders indicate that they are increasing in occurrence or are increasingly being detected and labeled (Neal, 2009). Once thought to affect only 1 in 2500 individuals, today's estimates suggest that they occur in about 1 in 150 individuals (Centers for Disease Control and Prevention, 2007).

Autistic disorder is a severe developmental autism spectrum disorder that has its onset in the first three years of life and includes deficiencies in social relationships, abnormalities in communication, and restricted, repetitive, and stereotyped patterns of behavior.

Asperger syndrome is a relatively mild autism spectrum disorder in which the child has relatively good verbal language, milder nonverbal language problems, and a restricted range of interests and relationships (Bennett & others, 2008). Children with Asperger syndrome often engage in obsessive repetitive routines and preoccupations with a particular subject. For example, a child may be obsessed with baseball scores or railroad timetables.

What causes the autism spectrum disorders? The current consensus is that autism is a brain dysfunction with abnormalities in brain structure and neurotransmitters (Anderson & others, 2009; Gilbert & others, 2009). Genetic factors also likely play a role in the development of the autism spectrum disorders (El-Fishawy & State, 2010; Shen & others, 2010). A recent study revealed that mutations—missing or duplicated pieces of DNA on chromosome 16—can raise a child's risk of developing autism 100-fold (Weiss & others, 2008). There is no evidence that family socialization causes autism.

Boys are four times as likely to have autism spectrum disorders as girls are (Gong & others, 2009). Expanding on autism's male-linkage, Simon Baron-Cohen (2008) recently argued that autism reflects an extreme male brain, especially indicative of males' less effective ability to show empathy and read facial expressions and gestures than girls. In an attempt to improve these skills in 4- to 8-year-old autistic boys, Baron-Cohen and his colleagues (2007) produced a number of animations on a DVD that place faces with different emotions on toy trains and tractor characters in a boy's bedroom (see Figure 9.7) (See www.thetransporters.com for a look at a

What characterizes autism spectrum disorders?

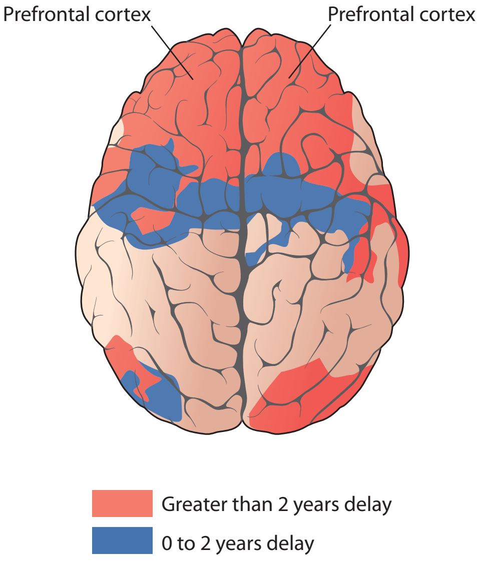


FIGURE **9.6**

REGIONS OF THE BRAIN IN WHICH CHILDREN WITH ADHD HAD A DELAYED PEAK IN THE THICKNESS OF THE CEREBRAL CORTEX.
Note: The greatest delays occurred in the prefrontal cortex.

developmental **connection**

Conditions, Diseases, and Disorders. Autistic children have difficulty in developing a theory of mind, especially in understanding other's beliefs and emotions. Chapter 7, p. 229

emotional and behavioral disorders Serious, persistent problems that involve relationships, aggression, depression, fears associated with personal or school matters, as well as other inappropriate socioemotional characteristics.

autism spectrum disorders (ASD) Also called pervasive developmental disorders, they range from the severe disorder labeled autistic disorder to the milder disorder called Asperger syndrome. Children with these disorders are characterized by problems in social interaction, verbal and nonverbal communication, and repetitive behaviors.

autistic disorder A severe autism spectrum disorder that has its onset in the first three years of life and includes deficiencies in social relationships, abnormalities in communication, and restricted, repetitive, and stereotyped patterns of behavior.

Asperger syndrome A relatively mild autism spectrum disorder in which the child has relatively good verbal language, milder nonverbal language problems, and a restricted range of interests and relationships.

number of the facial expression animations in addition to the one shown in Figure 9.7). After the autistic children watch the animations 15 minutes every weekday for one month, their ability to recognize real faces in a different context equaled that of children without autism.

Children with autism benefit from a well-structured classroom, individualized instruction, and small-group instruction. Behavior modification techniques are sometimes effective in helping autistic children learn (Boutat & Myles, 2011; Hall, 2009; Kasari & Lawton, 2010). A recent research review concluded that when these behavior modifications are intensely provided and used early in the life of the child with autism, they are more effective (Howlin, Magiati, & Charman, 2009).

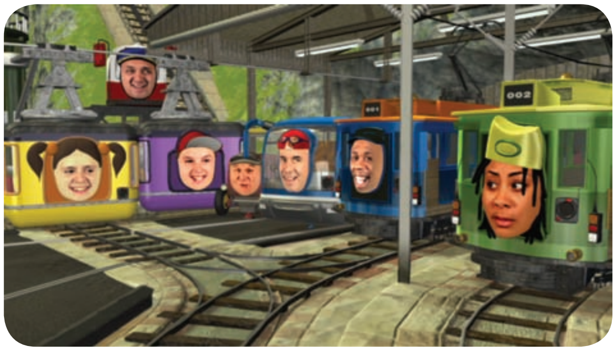


FIGURE **9.7**

A SCENE FROM THE DVD ANIMATIONS USED IN A STUDY BY BARON-COHEN AND OTHERS (2007). *What did they do to improve autistic children's ability to read facial expressions?* © Crown copyright MMVI, www.thetransporters.com, courtesy of Changing Media Development.

EDUCATIONAL ISSUES

Until the 1970s most U.S. public schools either refused enrollment to children with disabilities or inadequately served them. This changed in 1975, when Public Law 94-142, the Education for All Handicapped Children Act, required that all students with disabilities be given a free, appropriate public education. In 1990, Public Law 94-142 was recast as the Individuals with Disabilities Education Act (IDEA). IDEA was amended in 1997 and then reauthorized in 2004 and renamed the Individuals with Disabilities Education Improvement Act.

IDEA spells out broad mandates for services to children with disabilities of all kinds (Friend, 2011; Gargiulo, 2009). These services include evaluation and eligibility determination, appropriate education and an individualized education plan (IEP), and education in the least restrictive environment (LRE).

An **individualized education plan (IEP)** is a written statement that spells out a program that is specifically tailored for the student with a disability. The **least restrictive environment (LRE)** is a setting that is as similar as possible to the one in which children who do not have a disability are educated. This provision of the IDEA has given a legal basis to efforts to educate children with a disability in the regular classroom. The term **inclusion** describes educating a child with special education needs full-time in the regular classroom (Hick & Thomas, 2009; Valle & Connor, 2011). Figure 9.8 indicates that in a recent school year slightly more than 50 percent of U.S.

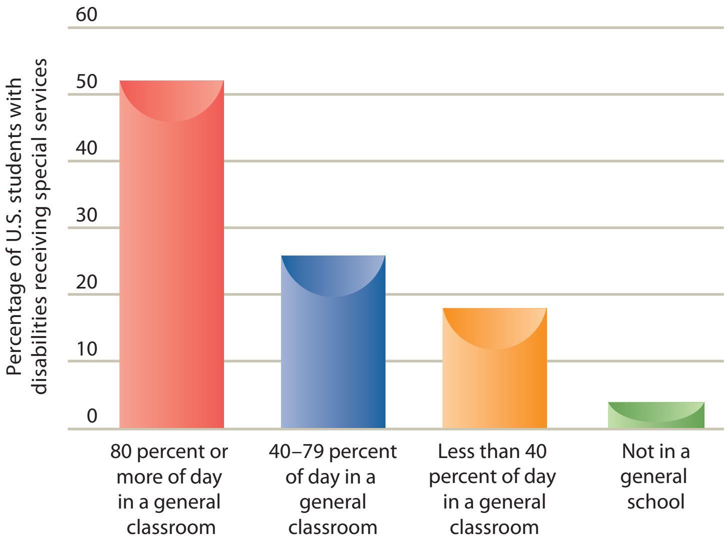


FIGURE **9.8**

PERCENTAGE OF U.S. STUDENTS WITH DISABILITIES 6 TO 21 YEARS OF AGE RECEIVING SPECIAL SERVICES IN THE GENERAL CLASSROOM (DATA FOR 2004–2005 SCHOOL YEAR; NATIONAL CENTER FOR EDUCATION STATISTICS, 2007)

individualized education plan (IEP) A written statement that spells out a program specifically tailored to a child with a disability.

least restrictive environment (LRE) A setting that is as similar as possible to the one in which children who do not have a disability are educated.

inclusion Educating a child with special education needs full-time in the regular classroom.

students with a disability spent more than 80 percent of their school day in a general classroom.

The outcomes of many legal changes regarding children with disabilities have been extremely positive (Carter, Prater, & Dyches, 2009; Rosenberg, Westling, & McLeskey, 2011). Compared with several decades ago, far more children today are receiving competent, specialized services. For many children, inclusion in the regular classroom, with modifications or supplemental services, is appropriate. However, some leading experts on special education argue that in some cases the effort to educate children with disabilities in the regular classroom has become too extreme. For example, James Kauffman and his colleagues (Kauffman, McGee, & Brigham, 2004) state that inclusion too often has meant making accommodations in the regular classroom that do not always benefit children with disabilities. They advocate a more individualized approach that does not always involve full inclusion but allows options such as special education outside the regular classroom. Kauffman and his colleagues (2004, p. 620) acknowledge that children with disabilities "*do* need the services of specially trained professionals" and "*do* sometimes need altered curricula or adaptations to make their learning possible." However, "we sell students with disabilities short when we pretend that they are not different from typical students. We make the same error when we pretend that they must *not* be expected to put forth extra effort if they are to learn to do some things—or learn to do something in a different way." Like general education, special education should challenge students with disabilities "to become all they can be."

IDEA mandates free, appropriate education for all children. *What services does IDEA mandate for children with disabilities?*

Review *Connect* Reflect

LG2 Identify children with different types of disabilities and issues in educating them.

Review

- Who are children with disabilities? What characterizes children with learning disabilities?
- How would you describe children with attention deficit hyperactivity disorder?
- What are autism spectrum disorders, what are they caused by, and how are they characterized?
- What are some issues in educating children with disabilities?

Connect

- In Chapters 5 and 7, you learned about the development of attention in infancy and early childhood. How might ADHD be linked to earlier attention difficulties in infancy and early childhood?

Reflect *Your Own Personal Journey of Life*

- Think about your own schooling and how children with learning disabilities or ADHD either were or were not diagnosed. Were you aware of such individuals in your classes? Were they helped by specialists? You may know one or more individuals with a learning disability or ADHD. Ask them about their educational experiences and whether they think schools could have done a better job of helping them.

3 Cognitive Changes

LG3 Explain cognitive changes in middle and late childhood.

Piaget's Cognitive Developmental Theory | Information Processing | Intelligence | Extremes of Intelligence

Do children enter a new stage of cognitive development in middle and late childhood? How do children process information in this age period? What is the nature of children's intelligence? Let's explore these questions.

> We owe to Piaget the present field of cognitive development with its image of the developing child, who through its own active and creative commerce with its environment, builds an orderly succession of cognitive structures enroute to intellectual maturity.
>
> —John Flavell
>
> *Contemporary Developmental Psychologist, Stanford University*

PIAGET'S COGNITIVE DEVELOPMENTAL THEORY

According to Piaget (1952), the preschool child's thought is preoperational. Preschool children can form stable concepts, and they have begun to reason, but their thinking is flawed by egocentrism and magical belief systems. As we discussed in Chapter 7, however, Piaget may have underestimated the cognitive skills of preschool children. Some researchers argue that under the right conditions, young children may display abilities that are characteristic of Piaget's next stage of cognitive development, the stage of concrete operational thought (Gelman, 1969). Here we will cover the characteristics of concrete operational thought and evaluate Piaget's portrait of this stage.

The Concrete Operational Stage Piaget proposed that the *concrete operational stage* lasts from approximately 7 to 11 years of age. In this stage, children can perform concrete operations, and they can reason logically as long as reasoning can be applied to specific or concrete examples. Remember that *operations* are mental actions that are reversible, and *concrete operations* are operations that are applied to real, concrete objects.

developmental **connection**

Centration, a centering of attention on one characteristic to the exclusion of all others, is present in young children's lack of conservation. Chapter 7, p. 218

The conservation tasks described in Chapter 7 indicate whether children are capable of concrete operations. For example, recall that in one task involving conservation of matter, the child is presented with two identical balls of clay. The experimenter rolls one ball into a long, thin shape; the other remains in its original ball shape. The child is then asked if there is more clay in the ball or in the long, thin piece of clay. By the time children reach the age of 7 or 8, most answer that the amount of clay is the same. To answer this problem correctly, children have to imagine the clay rolling back into a ball. This type of imagination involves a reversible mental action applied to a real, concrete object. Concrete operations allow the child to consider several characteristics rather than focus on a single property of an object. In the clay example, the preoperational child is likely to focus on height *or* width. The concrete operational child coordinates information about both dimensions.

What other abilities are characteristic of children who have reached the concrete operational stage? One important skill is the ability to classify or divide things into different sets or subsets and to consider their interrelationships. Consider the family tree of four generations that is shown in Figure 9.9 (Furth & Wachs, 1975). This family tree suggests that the grandfather (A) has three children (B, C, and D), each of whom has two children (E through J), and that one of these children (J) has three children (K, L, and M). A child who comprehends the classification system can move up and down a level, across a level, and up and down and across within the system. The concrete operational child understands that person J can at the same time be father, brother, and grandson, for example.

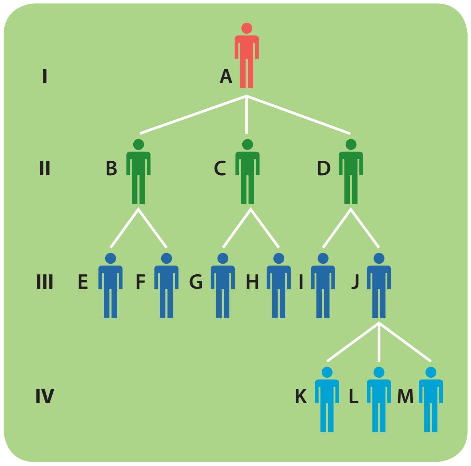


FIGURE **9.9**

CLASSIFICATION: AN IMPORTANT ABILITY IN CONCRETE OPERATIONAL THOUGHT. A family tree of four generations (*I to IV*): The preoperational child has trouble classifying the members of the four generations; the concrete operational child can classify the members vertically, horizontally, and obliquely (up and down and across). For example, the concrete operational child understands that a family member can be a son, a brother, and a father, all at the same time.

Children who have reached the concrete operational stage are also capable of **seriation,** which is the ability to order stimuli along a quantitative dimension (such as length). To see if students can serialize, a teacher might haphazardly place eight sticks of different lengths on a table. The teacher then asks the students to order the sticks by length. Many young children end up with two or three small groups of "big" sticks or "little" sticks, rather than a correct ordering of all eight sticks. Another mistaken strategy they use is to evenly line up the tops of the sticks but ignore the bottoms. The concrete operational thinker simultaneously understands that each stick must be longer than the one that precedes it and shorter than the one that follows it.

seriation The concrete operation that involves ordering stimuli along a quantitative dimension (such as length).

Another aspect of reasoning about the relations between classes is **transitivity,** which is the ability to logically combine relations to understand certain conclusions. In this case, consider three sticks (A, B, and C) of differing lengths. A is the longest, B is intermediate in length, and C is the shortest. Does the child understand that if A is longer than B and B is longer than C, then A is longer than C? In Piaget's theory, concrete operational thinkers do; preoperational thinkers do not.

transitivity The ability to logically combine relations to understand certain conclusions.

Evaluating Piaget's Concrete Operational Stage Has Piaget's portrait of the concrete operational child stood the test of research? According to Piaget, various

An outstanding teacher, and education in the logic of science and mathematics, are important cultural experiences that promote the development of operational thought. *Might Piaget have underestimated the roles of culture and schooling in children's cognitive development?*

aspects of a stage should emerge at the same time. In fact, however, some concrete operational abilities do not appear in synchrony. For example, children do not learn to conserve at the same time they learn to cross-classify.

Furthermore, education and culture exert stronger influences on children's development than Piaget reasoned (Holzman, 2009; Irvine & Berry, 2010). Some preoperational children can be trained to reason at a concrete operational stage. And the age at which children acquire conservation skills is related to how much practice their culture provides in these skills.

Thus, although Piaget was a giant in the field of developmental psychology, his conclusions about the concrete operational stage have been challenged. In Chapter 11, after examining the final stage in his theory of cognitive development, we will further evaluate Piaget's contributions and the criticisms of his theory.

Neo-Piagetians argue that Piaget got some things right but that his theory needs considerable revision. They give more emphasis to how children use attention, memory, and strategies to process information (Case & Mueller, 2001). They especially believe that a more accurate portrayal of children's thinking requires attention to children's strategies, the speed at which children process information, the particular task involved, and the division of problems into smaller, more precise steps (Morra & others, 2008). These are issues addressed by the information-processing approach, and we discuss some of them later in this chapter.

Another alternative comes from Vygotsky. As we discussed in Chapter 7, Vygotksy, like Piaget, held that children construct their knowledge of the world. But Vygotsky did not propose stages of cognitive development, and he emphasized the importance of social interaction, the social contexts of learning, and the child's use of language to plan, guide, and monitor behavior (Holzman, 2009).

> The thirst to know and understand. . . .
> These are the good in life's rich hand.
>
> —SIR WILLIAM WATSON
> *English Poet, 20th Century*

INFORMATION PROCESSING

If instead of analyzing the type of thinking that children display we examine how they handle information during middle and late childhood, what do we find? During these years, most children dramatically improve their ability to sustain and control attention. As we discussed in Chapter 7, they pay more attention to task-relevant stimuli than to salient stimuli. Other changes in information processing during middle and late childhood involve memory, thinking, and metacognition.

Memory In Chapter 7, we concluded that short-term memory increases considerably during early childhood but after the age of 7 does not show as much increase.

neo-Piagetians Developmentalists who argue that Piaget got some things right but that his theory needs considerable revision. They have elaborated on Piaget's theory, giving more emphasis to information processing, strategies, and precise cognitive steps.

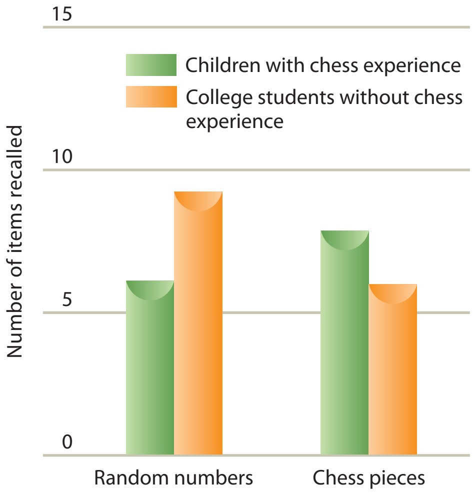


FIGURE **9.10**

THE ROLE OF EXPERTISE IN MEMORY. Notice that when 10- to 11-year-old children and college students were asked to remember a string of random numbers that had been presented to them, the college students fared better. However, the 10- to 11-year-olds who had experience playing chess ("experts") had better memory for the location of chess pieces on a chess board than college students with no chess experience ("novices") (Chi, 1978).

Long-term memory, a relatively permanent and unlimited type of memory, increases with age during middle and late childhood. In part, improvements in memory reflect children's increased knowledge and their increased use of strategies. Keep in mind that it is important not to view memory in terms of how children add something to it but rather to underscore how children actively construct their memory (Ornstein, Coffman, & Grammer, 2009; Ornstein & others, 2010).

Knowledge and Expertise Much of the research on the role of knowledge in memory has compared experts and novices. *Experts* have acquired extensive knowledge about a particular content area; this knowledge influences what they notice and how they organize, represent, and interpret information. This in turn affects their ability to remember, reason, and solve problems. When individuals have expertise about a particular subject, their memory also tends to be good regarding material related to that subject (Martinez, 2010).

For example, one study found that 10- and 11-year-olds who were experienced chess players ("experts") were able to remember more information about chess pieces than college students who were not chess players ("novices") (Chi, 1978) (see Figure 9.10). In contrast, when the college students were presented with other stimuli, they were able to remember them better than the children were. Thus, the children's expertise in chess gave them superior memories, but only in chess.

There are developmental changes in expertise (Blair & Somerville, 2009). Older children usually have more expertise about a subject than younger children do, which can contribute to their better memory for the subject.

Strategies If we know anything at all about long-term memory, it is that long-term memory depends on the learning activities individuals engage in when learning and remembering information (Ashcraft & Radvansky, 2010). Recall from Chapter 7 that *strategies* consist of deliberate mental activities to improve the processing of information. They do not occur automatically but require effort and work. Following are some effective strategies for adults to use when attempting to improve children's memory skills:

- *Encourage children to engage in mental imagery*. Mental imagery can help even young schoolchildren to remember pictures. However, for remembering verbal information, mental imagery works better for older children than for younger children (Schneider, 2004).
- *Motivate children to remember material by understanding it rather than by memorizing it.* Children will remember information better over the long term if they understand the information rather than just rehearse and memorize it. Rehearsal works well for encoding information into short-term memory, but when children need to retrieve the information from long-term memory, it is much less efficient. For most information, encourage children to understand it, give it meaning, elaborate on it, and personalize it. Give children concepts and ideas to remember and then ask them how they can relate the concepts and ideas to their own personal experiences and meanings. Give them practice on elaborating a concept so they will process the information more deeply.
- *Repeat with variation on the instructional information and link early and often.* These are memory development research expert Patricia Bauer's (2009b) recommendations to improve children's consolidation and reconsolidation of the information they are learning. Variations on a lesson theme increase the number of associations in memory storage and linking expands the network of associations in memory storage; both strategies expand the routes for retrieving information from storage.

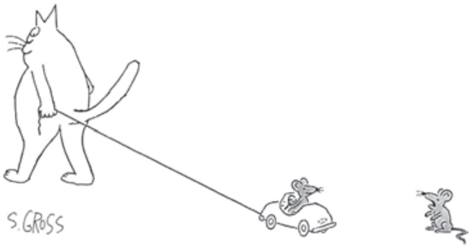
long-term memory A relatively permanent type of memory that holds huge amounts of information for a long period of time.

fuzzy trace theory States that memory is best understood by considering two types of memory representations: (1) verbatim memory trace, and (2) gist. In this theory, older children's better memory is attributed to the fuzzy traces created by extracting the gist of information.

- *Embed memory-relevant language when instructing children.* Teachers vary considerably in how much they use memory-relevant language that encourages students to remember information. In recent research that involved extensive observations of a number of first-grade teachers in the classroom, Peter Ornstein & his colleagues (Ornstein, Coffman, & Grammer, 2009; Ornstein & others, 2007, 2010) found that for the time segments observed the teachers' rarely used strategy suggestions or metacognitive (thinking about thinking) questions. In this research, when lower-achieving students were placed in classrooms in which teachers were categorized as "high-mnemonic teachers" who frequently embedded memory-relevant information in their teaching, their achievement increased (Ornstein & others, 2007).

MINDS AT WORK

Fuzzy Trace Theory Might something other than knowledge and strategies be responsible for the improvement in memory during the elementary school years? Charles Brainerd and Valerie Reyna (1993; Reyna, 2004) argue that fuzzy traces account for much of this improvement. Their **fuzzy trace theory** states that memory is best understood by considering two types of memory representations: (1) verbatim memory trace, and (2) gist. The *verbatim memory trace* consists of the precise details of the information, whereas *gist* refers to the central idea of the information. When gist is used, fuzzy traces are built up. Although individuals of all ages extract gist, young children tend to store and retrieve verbatim traces. At some point during the early elementary school years, children begin to use gist more and, according to the theory, this contributes to the improved memory and reasoning of older children because fuzzy traces are more enduring and less likely to be forgotten than verbatim traces.



"For God's sake, think! Why is he being so nice to you?"
© Sam Gross/The New Yorker Collection/www.cartoonbank.com

Thinking Three important aspects of thinking are being able to think critically, creatively, and scientifically.

Critical Thinking Currently, there is considerable interest among psychologists and educators in critical thinking (Bonny & Sternberg, 2010; Fairweather & Cramond, 2011). **Critical thinking** involves thinking reflectively and productively, and evaluating evidence. In this book, the second and third parts of the *Review, Connect, and Reflect* sections of each chapter challenge you to think critically about a topic or an issue related to the discussion.

According to Ellen Langer (2005), **mindfulness**—being alert, mentally present, and cognitively flexible while going through life's everyday activities and tasks—is an important aspect of thinking critically. Mindful children and adults maintain an active awareness of the circumstances in their life and are motivated to find the best solutions to tasks. Mindful individuals create new ideas, are open to new information, and operate from a single perspective. By contrast, mindless individuals are entrapped in old ideas, engage in automatic behavior, and operate from a single perspective.

What do you mean, "What is it?" It's the spontaneous, unfettered expression of a young mind not yet bound by the restraints of narrative or pictorial representation.
Science Cartoons Plus.com

Jacqueline and Martin Brooks (2001) lament that few schools really teach students to think critically and develop a deep understanding of concepts. Deep understanding occurs when students are stimulated to rethink previously held ideas. In Brooks and Brooks' view, schools spend too much time getting students to give a single correct answer in an imitative way, rather than encouraging them to expand their thinking by coming up with new ideas and rethinking earlier conclusions. They observe that too often teachers ask students to recite, define, describe, state, and list, rather than to analyze, infer, connect, synthesize, criticize, create, evaluate, think, and rethink. Many successful students complete their assignments, do well on tests and get good grades, yet they don't ever learn to think critically and deeply. They think superficially, staying on the surface of problems rather than stretching their minds and becoming deeply engaged in meaningful thinking.

Creative Thinking Cognitively competent children not only think critically, but also creatively (Kaufman & Sternberg, 2010). **Creative thinking** is the ability to

critical thinking Thinking reflectively and productively, as well as evaluating the evidence.

mindfulness Being alert, mentally present, and cognitively flexible while going through life's everyday activities and tasks.

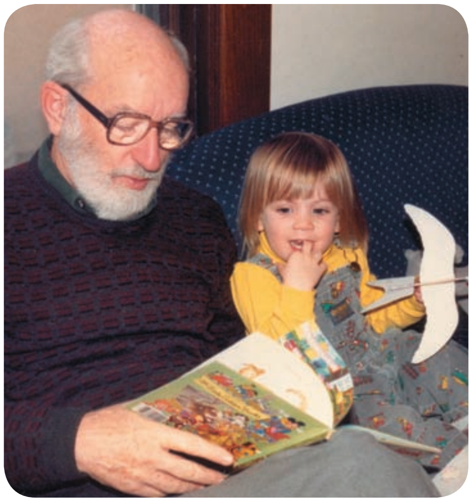
creative thinking The ability to think in novel and unusual ways and to come up with unique solutions to problems.

developmental **connection**

Creativity. How can you cultivate your curiosity and interest to live a more creative life? Chapter 13, p. 434

think in novel and unusual ways and to come up with unique solutions to problems. Thus, intelligence and creativity are not the same thing. This difference was recognized by J. P. Guilford (1967), who distinguished between **convergent thinking,** which produces one correct answer and characterizes the kind of thinking that is required on conventional tests of intelligence, and **divergent thinking,** which produces many different answers to the same question and characterizes creativity. For example, a typical item on a conventional intelligence test is "How many quarters will you get in return for 60 dimes?" In contrast, the following question has many possible answers: "What image comes to mind when you hear the phrase 'sitting alone in a dark room' or 'some unique uses for a paper clip'?"

It is important to recognize that children will show more creativity in some domains than others (Sternberg, 2010a). A child who shows creative thinking skills in mathematics may not exhibit these skills in art, for example. An important goal is to help children become more creative. The *Connecting Development to Life* on the following page examines some recommendations for ways to accomplish this goal.



Cognitive developmentalist John Flavell (*left*) is a pioneer in providing insights about children's thinking. Among his many contributions are establishing the field of metacognition and conducting numerous studies in this area, including metamemory and theory of mind studies.

Scientific Thinking Like scientists, children ask fundamental questions about reality and seek answers to problems that seem utterly trivial or unanswerable to other people (such as, Why is the sky blue?). Do children generate hypotheses, perform experiments, and reach conclusions about their data in ways resembling those of scientists?

Scientific reasoning often is aimed at identifying causal relations. Like scientists, children place a great deal of emphasis on causal mechanisms. Their understanding of how events are caused weighs more heavily in their causal inferences than even such strong influences as whether the cause happened immediately before the effect.

There also are important differences between the reasoning of children and the reasoning of scientists. For example, children have difficulty designing experiments that can distinguish among alternative causes (Kuhn & others, 2008). Instead, they tend to bias the experiments in favor of whatever hypothesis they began with. Sometimes they see the results as supporting their original hypothesis even when the results directly contradict it.

Too often, the skills scientists use, such as careful observation, graphing, self-regulatory thinking, and knowing when and how to apply one's knowledge to solve problems, are not routinely taught in schools. Children have many concepts that are incompatible with science and reality. Good teachers perceive and understand a child's underlying scientific concepts, then use the concepts as a scaffold for learning (Fraser Abder, 2011; Peters, 2011). Effective science teaching helps children distinguish between fruitful errors and misconceptions, and detect plainly wrong ideas that need to be replaced by more accurate conceptions (Bass, Contant, & Carin, 2009).

Metacognition

Metacognition is cognition about cognition, or knowing about knowing (Flavell, 2004). Many studies classified as "metacognitive" have focused on *metamemory,* or knowledge about memory. This includes general knowledge about memory, such as knowing that recognition tests are easier than recall tests. It also encompasses knowledge about one's own memory, such as a student's ability to monitor whether she has studied enough for a test that is coming up next week.

Young children do have some general knowledge about memory (Harris & others, 2010). By 5 or 6 years of age, children usually already know that familiar items are easier to learn than unfamiliar ones, that short lists are easier than long ones, that recognition is easier than recall, and that forgetting is more likely to occur over time (Lyon & Flavell, 1993). However, in other ways young children's metamemory is limited. They don't understand that related items are easier to remember than unrelated ones and that remembering the gist of a story is easier than remembering information verbatim (Kreutzer, Leonard, & Flavell, 1975). By the fifth grade, students understand that gist recall is easier than verbatim recall.

convergent thinking Thinking that produces one correct answer and is characteristic of the kind of thinking tested by standardized intelligence tests.

divergent thinking Thinking that produces many answers to the same question and is characteristic of creativity.

metacognition Cognition about cognition, or knowing about knowing.

brainstorming A technique in which individuals are encouraged to come up with creative ideas in a group, play off each other's ideas, and say practically whatever comes to mind.

connecting development to life

Strategies for Increasing Children's Creative Thinking

Here are strategies for increasing children's creative thinking.

Encourage Brainstorming

Brainstorming is a technique in which people are encouraged to come up with creative ideas in a group, play off each other's ideas, and say practically whatever comes to mind that seems relevant to a particular issue. Facilitators usually tell participants to hold off from criticizing others' ideas at least until the end of the brainstorming session.

Provide Environments That Stimulate Creativity

Some environments nourish creativity, others inhibit it. Parents and teachers who encourage creativity often rely on children's natural curiosity. They provide exercises and activities that stimulate children to find insightful solutions to problems, rather than ask a lot of questions that require rote answers (Beghetto & Kaufman, 2011; Skiba & others, 2010; Sternberg, 2010b). Teachers also encourage creativity by taking students on field trips to locations where creativity is valued. Science, discovery, and children's museums offer rich opportunities to stimulate creativity.

Don't Overcontrol Children

Teresa Amabile (1993) says that telling children exactly how to do things leaves them feeling that originality is a mistake and exploration is a waste of time. Instead of dictating which activities they should engage in, teachers and parents who let children select their interests and who support their inclinations are less likely to destroy their natural curiosity (Hennessey, 2011; Hennessey & Amabile, 2010).

Encourage Internal Motivation

Parents and teachers should avoid excessive use of prizes, such as gold stars, money, or toys, which can stifle creativity by undermining the intrinsic pleasure students derive from creative activities (Hennessey, 2011). Creative children's motivation is the satisfaction generated by the work itself.

Build Children's Confidence

To expand children's creativity, teachers and parents should encourage children to believe in their own ability to create something innovative and worthwhile. Building children's confidence in their creative skills aligns with Bandura's (2008, 2009, 2010a) concept of *self-efficacy,* the belief that one can master a situation and produce positive outcomes.

Guide Children to Be Persistent and Delay Gratification

Parents and teachers need to be patient and understand that most highly successful creative products take years to develop. Most creative individuals work on ideas and projects for months and years without being rewarded for their efforts.

What are some good strategies for guiding children in thinking more creatively?

Encourage Children to Take Intellectual Risks

Parents and teachers should encourage children to take intellectual risks. Creative individuals take intellectual risks and seek to discover or invent something never before discovered or invented. Creative people are not afraid of failing or getting something wrong (Beghetto & Kaufman, 2009).

Introduce Children to Creative People

Teachers can invite creative people to their classrooms and ask them to describe what helps them become creative or to demonstrate their creative skills. A writer, poet, musician, scientist, and many others can bring their props and productions to the class, turning it into a theater for stimulating students' creativity.

You learned that it is important to recognize that children will show more creativity in some domains than others. Choose one of the strategies mentioned above and describe how you would implement it differently to encourage creativity in writing, science, math, and art in children in middle and late childhood.

developmental **connection**

Cognitive Theory. Theory of mind—awareness of one's own mental processes and the mental processes of others—involves metacognition. Chapter 7, p. 226

Alfred Binet constructed the first intelligence test after being asked to create a measure to determine which children could benefit from instruction in France's schools and which could not.

developmental **connection**

Intelligence. Does intelligence decrease when individuals become middle-aged? Chapter 15, p. 488

intelligence Problem-solving skills and the ability to learn from and adapt to the experiences of everyday life.

individual differences The stable, consistent ways in which people are different from each other.

mental age (MA) Binet's measure of an individual's level of mental development, compared with that of others.

intelligence quotient (IQ) A person's mental age divided by chronological age, multiplied by 100.

normal distribution A symmetrical distribution with most scores falling in the middle of the possible range of scores and a few scores appearing toward the extremes of the range.

triarchic theory of intelligence Sternberg's theory that intelligence consists of analytical intelligence, creative intelligence, and practical intelligence.

Young children also have only limited knowledge about their own memory. They have an inflated opinion of their memory abilities. For example, in one study a majority of young children predicted that they would be able to recall all 10 items on a list of 10 items. When tested for this, none of the young children managed this feat (Flavell, Friedrichs, & Hoyt, 1970). As they move through the elementary school years, children give more realistic evaluations of their memory skills.

In addition to metamemory, metacognition includes knowledge about strategies (White, Fredrikson, & Collins, 2010). In the view of Michael Pressley (2003), the key to education is helping students learn a rich repertoire of strategies that result in solutions to problems. Good thinkers routinely use strategies and effective planning to solve problems. Good thinkers also know when and where to use strategies. Understanding when and where to use strategies often results from monitoring the learning situation (Serra & others, 2010).

Pressley and his colleagues (Pressley & others, 2003, 2004, 2007) spent considerable time in recent years observing strategy instruction by teachers and strategy use by students in elementary and secondary school classrooms. They conclude that strategy instruction is far less complete and intense than what students need in order to learn how to use strategies effectively. They argue that education needs to be restructured so that students are provided with more opportunities to become competent strategic learners.

INTELLIGENCE

How can intelligence be defined? **Intelligence** is the ability to solve problems and to adapt and learn from experiences. Interest in intelligence has often focused on individual differences and assessment. **Individual differences** are the stable, consistent ways in which people are different from each other. We can talk about individual differences in personality or any other domain, but it is in the domain of intelligence that the most attention has been directed at individual differences. For example, an intelligence test purports to inform us about whether a student can reason better than others who have taken the test. Let's go back in history and see what the first intelligence test was like.

The Binet Tests

In 1904, the French Ministry of Education asked psychologist Alfred Binet to devise a method of identifying children who were unable to learn in school. School officials wanted to reduce crowding by placing students who did not benefit from regular classroom teaching in special schools. Binet and his student Theophile Simon developed an intelligence test to meet this request. The test is called the 1905 Scale. It consisted of 30 questions on topics ranging from the ability to touch one's ear to the ability to draw designs from memory and define abstract concepts.

Binet developed the concept of **mental age (MA),** an individual's level of mental development relative to others. Not much later, in 1912, William Stern created the concept of **intelligence quotient (IQ),** a person's mental age divided by chronological age (CA), multiplied by 100. That is: $IQ = MA/CA \times 100$. If mental age is the same as chronological age, then the person's IQ is 100. If mental age is above chronological age, then IQ is more than 100. If mental age is below chronological age, then IQ is less than 100.

The Binet test has been revised many times to incorporate advances in the understanding of intelligence and intelligence tests. These revisions are called the *Stanford-Binet tests* (Stanford University is where the revisions have been done). In 2004, the test—now called the Stanford Binet 5—was revised to analyze an individual's response in five content areas: fluid reasoning, knowledge, quantitative reasoning, visual-spatial reasoning, and working memory. A general composite score also is still obtained.

By administering the test to large numbers of people of different ages (from preschool through late adulthood) from different backgrounds, researchers have

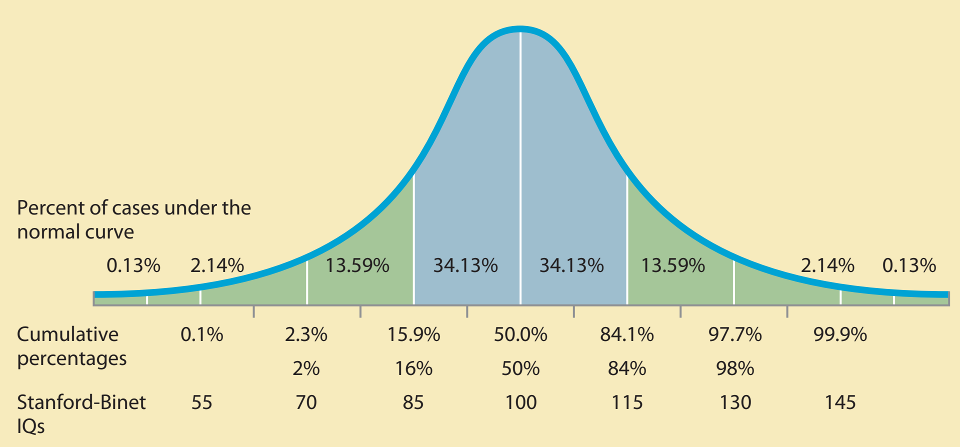


FIGURE **9.11**

THE NORMAL CURVE AND STANFORD-BINET IQ SCORES. The distribution of IQ scores approximates a normal curve. Most of the population falls in the middle range of scores. Notice that extremely high and extremely low scores are very rare. Slightly more than two-thirds of the scores fall between 85 and 115. Only about 1 in 50 individuals has an IQ of more than 130, and only about 1 in 50 individuals has an IQ of less than 70.

found that scores on the Stanford-Binet approximate a normal distribution (see Figure 9.11). A **normal distribution** is symmetrical, with a majority of the scores falling in the middle of the possible range of scores and few scores appearing toward the extremes of the range.

The Wechsler Scales Another set of tests widely used to assess students' intelligence is called the *Wechsler scales,* developed by psychologist David Wechsler. They include the Wechsler Preschool and Primary Scale of Intelligence—Third Edition (WPPSI-III) to test children from the ages of 2 years 6 months to 7 years 3 months of age; the Wechsler Intelligence Scale for Children—Fourth Edition (WISC-IV) for children and adolescents 6 to 16 years of age; and the Wechsler Adult Intelligence Scale—Third Edition (WAIS-III).

The Wechsler scales not only provide an overall IQ score, but they also yield several composite indexes (for example, the Verbal Comprehension Index, the Working Memory Index, and the Processing Speed Index) that allow the examiner to quickly determine the areas in which the child is strong or weak. Three of the Wechsler subscales are shown in Figure 9.12.

Types of Intelligence Is it more appropriate to think of a child's intelligence as a general ability or as a number of specific abilities? Robert Sternberg and Howard Gardner have proposed influential theories oriented to this second viewpoint.

Sternberg's Triarchic Theory Robert J. Sternberg (1986, 2004, 2008, 2009a, b, 2010c, d) developed the **triarchic theory of intelligence,** which states that intelligence comes in three forms: (1) *analytical intelligence,* which refers to the ability to analyze, judge, evaluate, compare, and contrast; (2) *creative intelligence,* which consists of the ability to create, design, invent, originate, and imagine; and (3) *practical intelligence,* which involves the ability to use, apply, implement, and put ideas into practice.

Sternberg (2009a, b, 2010c, d) says that children with different triarchic patterns "look different" in school. Students with high analytic ability tend to be favored in conventional schooling. They often do well under direct instruction, in which the teacher lectures and gives students objective tests. They often are considered to be "smart" students who get good grades, show up in high-level tracks, do well on traditional tests of intelligence and the SAT, and later get admitted to competitive colleges.

Verbal Subscales

Similarities

A child must think logically and abstractly to answer a number of questions about how things might be similar.

Example: "In what way are a lion and a tiger alike?"

Comprehension

This subscale is designed to measure an individual's judgment and common sense.

Example: "What is the advantage of keeping money in a bank?"

Nonverbal Subscales

Block Design

A child must assemble a set of multicolored blocks to match designs that the examiner shows.
Visual-motor coordination, perceptual organization, and the ability to visualize spatially are assessed.

Example: "Use the four blocks on the left to make the pattern on the right."

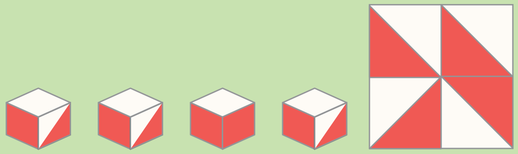


FIGURE **9.12**

SAMPLE SUBSCALES OF THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN—FOURTH EDITION (WISC-IV). The Wechsler includes 11 subscales, 6 verbal and 5 nonverbal. Three of the subscales are shown here. Simulated items similar to those found in the *Wechsler Intelligence Scale for Children—Fourth Edition.* Copyright © 2004 by NCS Pearson, Inc. Reproduced by permission. All rights reserved. "Wechsler Intelligence Scale for Children" and "WISC" are trademarks of Harcourt Assessment, Inc. registered in the United States of America and/or other jurisdictions.

Robert J. Sternberg, who developed the triarchic theory of intelligence.

In contrast, children who are high in creative intelligence often are not on the top rung of their class. Many teachers have specific expectations about how assignments should be done, and creatively intelligent students may not conform to those expectations. Instead of giving conformist answers, they give unique answers, for which they might get reprimanded or marked down. No teacher wants to discourage creativity, but Sternberg stresses that too often a teacher's desire to improve students' knowledge suppresses creative thinking.

Like children high in creative intelligence, children who are practically intelligent often do not relate well to the demands of school. However, many of these children do well outside of the classroom's walls. They may have excellent social skills and good common sense. As adults, some become successful managers, entrepreneurs, or politicians in spite of having undistinguished school records.

Gardner's Eight Frames of Mind Howard Gardner (1983, 1993, 2002) suggests there are eight types of intelligence, or "frames of mind." These are described here, with examples of the types of vocations in which they are reflected as strengths (Campbell, Campbell, & Dickinson, 2004):

Verbal: The ability to think in words and use language to express meaning. Occupations: Authors, journalists, speakers.

Mathematical: The ability to carry out mathematical operations. Occupations: Scientists, engineers, accountants.

Spatial: The ability to think three-dimensionally. Occupations: Architects, artists, sailors.

Bodily-kinesthetic: The ability to manipulate objects and be physically adept. Occupations: Surgeons, craftspeople, dancers, athletes.

Musical: A sensitivity to pitch, melody, rhythm, and tone. Occupations: Composers, musicians, and sensitive listeners.

Interpersonal: The ability to understand and interact effectively with others. Occupations: Successful teachers, mental health professionals.

Intrapersonal: The ability to understand oneself. Occupations: Theologians, psychologists.

Naturalist: The ability to observe patterns in nature and understand natural and human-made systems. Occupations: Farmers, botanists, ecologists, landscapers.

"You're wise, but you lack tree smarts."
© Donald Reilly/The New Yorker Collection/
www.cartoonbank.com

According to Gardner, everyone has all of these intelligences to varying degrees. As a result, we prefer to learn and process information in different ways. People learn best when they can do so in a way that uses their stronger intelligences.

Children in the Key School form "pods," in which they pursue activities of special interest to them. Every day, each child can choose from activities that draw on Gardner's eight frames of mind. The school has pods that range from gardening to architecture to gliding to dancing.

Evaluating the Multiple-Intelligence Approaches Sternberg's and Gardner's approaches have much to offer. They have stimulated teachers to think more broadly about what makes up children's competencies. And they have motivated educators to develop programs that instruct students in multiple domains. These approaches have also contributed to interest in assessing intelligence and classroom learning in innovative ways, such as by evaluating student portfolios (Moran & Gardner, 2006, 2007).

However, doubts about multiple-intelligences approaches persist. A number of psychologists think that the multiple-intelligence views have taken the concept of specific intelligences too far (Reeve & Charles, 2008). Some argue that a research base to support the three intelligences of Sternberg or the eight intelligences of Gardner has not yet emerged. One expert on intelligence, Nathan Brody (2007), observes that people who excel at one type of intellectual task are likely to excel in others. Thus, individuals who do well at memorizing lists of digits are also likely to be good at solving verbal problems and spatial layout problems. If musical skill reflects a distinct type of intelligence, ask other critics, why not label the skills of outstanding chess players, prizefighters, painters, and poets as types of intelligence?

The argument between those who support the concept of general intelligence and those who advocate the multiple-intelligences view is ongoing (Brody, 2007; Sternberg, 2009a, b, 2010c, d). Sternberg (2009a, b, 2010c, d) actually accepts that there is a general intelligence for the kinds of analytical tasks that traditional IQ tests assess but thinks that the range of tasks those tests measure is far too narrow.

Culture and Intelligence Differences in conceptions of intelligence occur not only among psychologists but also among cultures (Zhang & Sternberg, 2011). What is viewed as intelligent in one culture may not be thought of as intelligent in another. For example, people in Western cultures tend to view intelligence in terms of reasoning and thinking skills, whereas people in Eastern cultures see intelligence as a way for members of a community to engage successfully in social roles (Nisbett, 2003).

Interpreting Differences in IQ Scores The IQ scores that result from tests such as the Stanford-Binet and Wechsler scales provide information about children's mental abilities. However, interpreting what performance on an intelligence test means is a subject of debate among researchers.

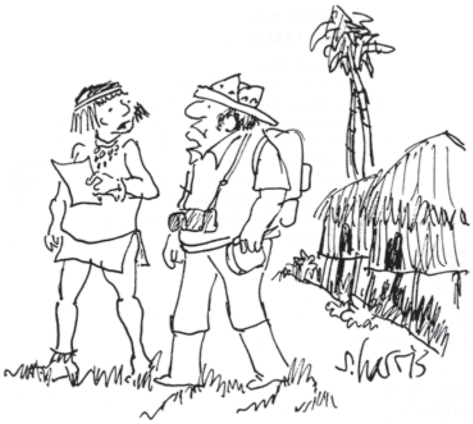
The Influence of Genetics How strong is the effect of genetics on intelligence? This question is difficult to answer because as we discussed in Chapter 2 teasing apart heredity and environment is virtually impossible. Also, most research on heredity and environment does not include environments that differ radically. Thus, it is not surprising that many genetic studies show environment to be a fairly weak influence on intelligence.

One strategy for examining the role of heredity in intelligence is to compare the IQs of identical and fraternal twins, which we initially discussed in Chapter 2. Recall that identical twins have exactly the same genetic makeup but fraternal twins do not. If intelligence is genetically determined, say some investigators, identical twins' IQs should be more similar than the intelligence of fraternal twins. A research review of many studies found that the difference in the average correlation of intelligence between identical and fraternal twins was .15, a relatively low correlation (Grigorenko, 2000) (see Figure 9.13).

Today, most researchers agree that genetics and environment interact to influence intelligence. For most people, this means that modifications in environment can change their IQ scores considerably. Although genetic endowment may always influence a person's intellectual ability, the environmental influences and opportunities we provide children and adults do make a difference.

Environmental Influences In Chapter 5 we described one study that demonstrated the influence of parents on cognitive abilities. Researchers went into homes and observed how extensively parents from welfare and middle-income professional families talked and communicated with their young children (Hart & Risley, 1995). They found that the middle-income professional parents were much more likely to communicate with their young children than the welfare parents were. How much the parents communicated with their children in the first three years of their lives was correlated with the children's Stanford-Binet IQ scores at age 3. The more parents communicated with their children, the higher the children's IQs were.

Schooling also influences intelligence (Gustafsson, 2007). The biggest effects have been found when large groups of children have been deprived of formal education for an extended period, resulting in lower intelligence (Ceci & Gilstrap, 2000). Another possible effect of education can be seen in rapidly increasing IQ test scores



"You can't build a hut, you don't know how to find edible roots and you know nothing about predicting the weather. In other words, you do terribly on our I.Q. test."
ScienceCartoonsPlus.com

developmental **connection**

Nature vs. Nurture. The epigenetic view emphasizes that development is an ongoing, bidirectional interchange between heredity and environment. Chapter 2, p. 74

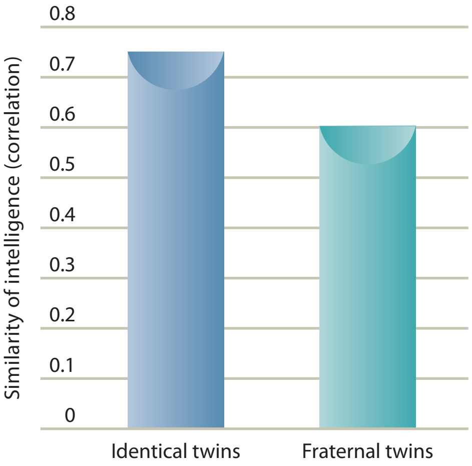


FIGURE **9.13**

CORRELATION BETWEEN INTELLIGENCE TEST SCORES AND TWIN STATUS. The graph represents a summary of research findings that have compared the intelligence test scores of identical and fraternal twins. An approximate .15 difference has been found with a higher correlation for identical twins (.75) and a lower correlation for fraternal twins (.60).

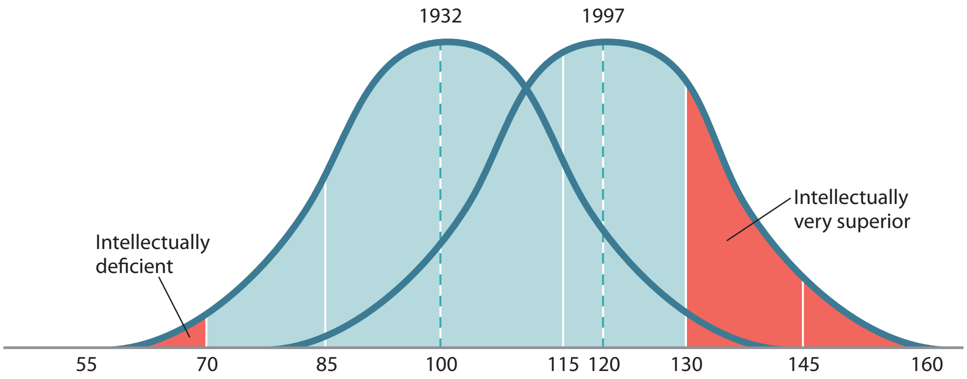


FIGURE **9.14**

INCREASING IQ SCORES FROM 1932 TO 1997. As measured by the Stanford-Binet intelligence test, American children seem to be getting smarter. Scores of a group tested in 1932 fell along a bell-shaped curve with half below 100 and half above. Studies show that if children took that same test today, half would score above 120 on the 1932 scale. Very few of them would score in the "intellectually deficient" end, on the left side, and about one-fourth would rank in the "very superior" range.

around the world (Flynn, 1999, 2007). IQ scores have been increasing so fast that a high percentage of people regarded as having average intelligence at the turn of the century would be considered below average in intelligence today (see Figure 9.14). If a representative sample of people today took the Stanford-Binet test version used in 1932, about 25 percent would be defined as having very superior intelligence, a label usually accorded to fewer than 3 percent of the population. Because the increase has taken place in a relatively short time, it can't be due to heredity, but rather may be due to increasing levels of education attained by a much greater percentage of the world's population, or to other environmental factors such as the explosion of information to which people are exposed. The worldwide increase in intelligence test scores that has occurred over a short time frame has been called the *Flynn effect* after the researcher who discovered it, James Flynn.

Researchers are increasingly concerned about improving the early environment of children who are at risk for impoverished intelligence (Barajas, Philipsen, & Brooks-Gunn, 2008). For various reasons, many low-income parents have difficulty providing an intellectually stimulating environment for their children. Programs that educate parents to be more sensitive caregivers and better teachers, as well as support services such as quality child-care programs, can make a difference in a child's intellectual development (Coltrane & others, 2008). Thus the efforts to counteract a deprived early environment's effect on intelligence emphasize prevention rather than remediation.

A review of the research on early interventions concluded that (1) high-quality interventions based in child-care centers are associated with increases in children's intelligence and school achievement; (2) the interventions are most successful with poor children and children whose parents have little education; (3) the positive benefits continue through adolescence, but are not as strong as in early childhood or the beginning of elementary school; and (4) the programs that continue into middle and late childhood have the best long-term results (Brooks-Gunn, 2003). To read further about environmental influences on intelligence, see *Connecting Through Research*.

In sum, there is a consensus among psychologists that both heredity and environment influence intelligence (Grigorenko & Takanishi, 2010). This consensus reflects the nature-nurture issue that was highlighted in Chapter 1. Recall that the nature-nurture issue focuses on the extent to which development is influenced by nature (heredity) and nurture (environment). Although psychologists agree that intelligence is the product of both nature and nurture, there is still disagreement about how strongly each influences intelligence.

Group Differences

On the average, African American schoolchildren in the United States score 10 to 15 points lower on standardized intelligence tests than non–Latino White American schoolchildren do (Brody, 2000). Children from Latino families also score lower than non–Latino White children. These are *average scores,* however; there is significant overlap in the distribution of scores. About 15 to 25 percent of African

connecting through research

How Much Does Environment Affect Intelligence?

Each morning a young mother waited with her child for the bus that would take the child to school. The child was only 2 months old, and "school" was an experimental program at the University of North Carolina at Chapel Hill. There the child experienced a number of interventions designed to improve her intellectual development—everything from bright objects dangled in front of her eyes while she was a baby to language instruction and counting activities when she was a toddler (Wickelgren, 1999). The child's mother had an IQ of 40 and could not read signs or determine how much change she should receive from a cashier. Her grandmother had a similarly low IQ.

Today, at age 20, the child's IQ measures 80 points higher than her mother's did when the child was 2 months old. Not everyone agrees that IQ can be affected this extensively, but environment can make a substantial difference in a child's intelligence. As behavior geneticist Robert Plomin (1999) says, even something that is highly heritable (like intelligence) may be malleable through interventions.

The child we just described was part of the Abecedarian Intervention program at the University of North Carolina at Chapel Hill conducted by Craig Ramey and his associates (Ramey & Campbell, 1984; Ramey & Ramey, 1998; Ramey, Ramey, & Lanzi, 2001). They randomly assigned 111 young children from low-income, poorly educated families to either an intervention group, which received full-time, year-round child care along with medical and social work services, or to a control group, which received medical and social benefits but no child care. The child-care program included game-like learning activities aimed at improving language, motor, social, and cognitive skills.

The success of the program in improving IQ was evident by the time the children were 3 years old. At that age, the experimental group showed normal IQs averaging 101, a 17-point advantage over the control group. Recent follow-up results suggest that the effects are long-lasting. More than a decade later at age 15, children from the intervention group still maintained an IQ advantage of 5 points over the control-group children (97.7 to 92.6) (Campbell & others, 2001; Ramey, Ramey, & Lanzi, 2001). They also did better on standardized tests of reading and math, and were less likely to be held back a year in school. Also, the greatest IQ gains were made by the children whose mothers had especially low IQs—below 70. At age 15, these children showed a 10-point IQ advantage over a group of children whose mothers' IQs were below 70 but did not experience the child-care intervention.

This research reinforces the research mentioned earlier that found prevention rather than remediation is important in counteracting a deprived early environment's effect on intelligence. It also supports the conclusion that modifications in environment can change IQ scores considerably. Therefore, it is important to consider the types of environments we provide for children—both those in the general population and those with disabilities (Waber, 2010).

American schoolchildren score higher than half of White schoolchildren do, and many White schoolchildren score lower than most African American schoolchildren. As African Americans have gained social, economic, and educational opportunities, the gap between African Americans and Whites on standardized intelligence tests has begun to narrow. This gap especially narrows in college, where African American and White students often experience more similar environments than in the elementary and high school years (Myerson & others, 1998).

Creating Culture-Fair Tests **Culture-fair tests** are tests of intelligence that are intended to be free of cultural bias. Two types of culture-fair tests have been devised. The first includes items that are familiar to children from all socioeconomic and ethnic backgrounds, or items that at least are familiar to the children taking the test. For example, a child might be asked how a bird and a dog are different, on the assumption that all children have been exposed to birds and dogs. The second type of culture-fair test has no verbal questions. Figure 9.15 shows a sample question from the Raven's Progressive Matrices Test. Even though tests such as the Raven's Progressive Matrices are designed to be culture-fair, people with more education still score higher on them than do those with less education.

Why is it so hard to create culture-fair tests? Most tests tend to reflect what the dominant culture thinks is important (Matsumoto & Juang, 2008). If tests have time limits, that will bias the test against groups not concerned with time. If languages differ, the same words might have different meanings for different language groups.

culture-fair tests Tests of intelligence that are designed to be free of cultural bias.

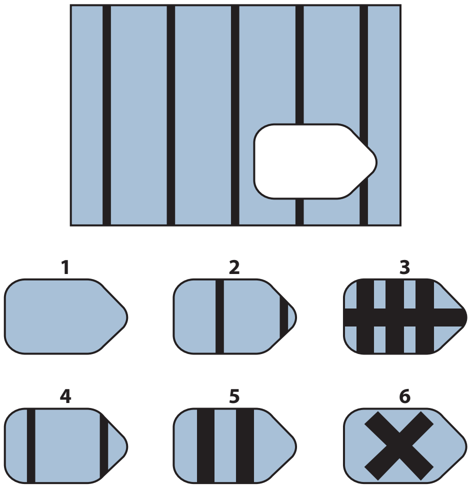


FIGURE **9.15**

SAMPLE ITEM FROM THE RAVEN'S PROGRESSIVE MATRICES TEST. Individuals are presented with a matrix arrangement of symbols, such as the one at the top of this figure, and must then complete the matrix by selecting the appropriate missing symbol from a group of symbols, such as the ones at the bottom. These symbols and the matrix are similar to those found in the *Raven's Progressive Matrices.* Copyright © 1998 by NCS Pearson, Inc. Reproduced with permission. All rights reserved.

Even pictures can produce bias because some cultures have less experience with drawings and photographs. Because of such difficulties in creating culture-fair tests, Robert Sternberg and his colleagues (Sternberg, 2010e; Zhang & Sternberg, 2011) conclude that there are no culture-fair tests, only *culture-reduced tests.*

Using Intelligence Tests Here are some cautions about IQ that can help you avoid the pitfalls of using information about a child's intelligence in negative ways:

- *Avoid stereotyping and expectations.* A special concern is that the scores on an IQ test easily can lead to stereotypes and expectations about students. Sweeping generalizations are too often made on the basis of an IQ score. An IQ test should always be considered a measure of current performance. It is not a measure of fixed potential. Maturational changes and enriched environmental experiences can advance a student's intelligence.
- *Know that IQ is not a sole indicator of competence.* Another concern about IQ tests occurs when they are used as the main or sole assessment of competence. A high IQ is not the ultimate human value. As we have seen in this chapter, it is important to consider not only students' intellectual competence in such areas as verbal skills but also their creative and practical skills.
- *Use caution in interpreting an overall IQ score.* In evaluating a child's intelligence, it is wiser to think of intelligence as consisting of a number of domains. Keep in mind the different types of intelligence described by Sternberg and Gardner. Remember that by considering the different domains of intelligence you can find that every child has at least one or more strengths.

EXTREMES OF INTELLIGENCE

Intelligence tests have been used to discover indications of mental retardation or intellectual giftedness, the extremes of intelligence. At times, intelligence tests have been misused for this purpose. Keeping in mind the theme that an intelligence test should not be used as the sole indicator of mental retardation or giftedness, we will explore the nature of these intellectual extremes.

A child with Down syndrome. *What causes a child to develop Down syndrome? In which major classification of mental retardation does the condition fall?*

Mental Retardation **Mental retardation** is a condition of limited mental ability in which an individual has a low IQ, usually below 70 on a traditional intelligence test, and has difficulty adapting to everyday life. About 5 million Americans fit this definition of mental retardation.

There are several classifications of mental retardation (Hallahan, Kaufmann, & Pullen, 2009). About 89 percent of those with mental retardation fall into the mild category, with IQs of 55 to 70; most of them are able to live independently as adults and work at a variety of jobs. About 6 percent are classified as having moderate mental retardation, with IQs of 40 to 54; these people can attain a second-grade level of skills and may be able to support themselves as adults through some types of labor. About 3.5 percent of those with mental retardation are in the severe category, with IQs of 25 to 39; these individuals learn to talk and accomplish very simple tasks but require extensive supervision. Less than 1 percent have IQs below 25; they fall into the profoundly mentally retarded classification and need constant supervision.

Mental retardation can have an organic cause, or it can be social and cultural in origin:

- **Organic retardation** is mental retardation that is caused by a genetic disorder or by brain damage; the word *organic* refers to the tissues or organs of the body, indicating physical damage. Most people who suffer from organic retardation have IQs that range between 0 and 50. However, children with Down syndrome have an average IQ of approximately 50. As discussed in Chapter 2, Down syndrome is caused by an extra copy of chromosome 21.

mental retardation A condition of limited mental ability in which an individual has a low IQ, usually below 70 on a traditional test of intelligence, and has difficulty adapting to everyday life.

- **Cultural-familial retardation** is a mental deficit in which no evidence of organic brain damage can be found; individuals' IQs generally range from 50 to 70. Psychologists suspect that such mental deficits result from the normal variation that distributes people along the range of intelligence scores combined with growing up in a below-average intellectual environment.

Giftedness There have always been people whose abilities and accomplishments outshine others'—the whiz kid in class, the star athlete, the natural musician. People who are **gifted** have above-average intelligence (an IQ of 130 or higher) and/or superior talent for something. When it comes to programs for the gifted, most school systems select children who have intellectual superiority and academic aptitude, whereas children who are talented in the visual and performing arts (arts, drama, dance), athletics, or who have other special aptitudes tend to be overlooked (Horowitz, 2009; Liben, 2009; Winner, 2009).

Characteristics What are the characteristics of children who are gifted? Despite speculation that giftedness is linked with having a mental disorder, no relation between giftedness and mental disorder has been found. Similarly, the idea that gifted children are maladjusted is a myth, as Lewis Terman (1925) found when he conducted an extensive study of 1,500 children whose Stanford-Binet IQs averaged 150. The children in Terman's study were socially well adjusted, and many went on to become successful doctors, lawyers, professors, and scientists. Studies support the conclusion that gifted people tend to be more mature than others, have fewer emotional problems than others, and grow up in a positive family climate (Davidson, 2000).

Ellen Winner (1996) described three criteria that characterize gifted children, whether in art, music, or academic domains:

1. *Precocity.* Gifted children are precocious. They begin to master an area earlier than their peers. Learning in their domain is more effortless for them than for ordinary children. In most instances, these gifted children are precocious because they have an inborn high ability in a particular domain or domains.
2. *Marching to their own drummer.* Gifted children learn in a qualitatively different way than ordinary children. One way that they march to a different drummer is that they need minimal help, or scaffolding, from adults to learn. In many instances, they resist any kind of explicit instruction. They often make discoveries on their own and solve problems in unique ways.
3. *A passion to master.* Gifted children are driven to understand the domain in which they have high ability. They display an intense, obsessive interest and an ability to focus. They motivate themselves, says Winner, and do not need to be "pushed" by their parents.

Nature-Nurture Is giftedness a product of heredity or environment? Likely both (Sternberg, 2009c). Individuals who are gifted recall that they had signs of high ability in a particular area at a very young age, prior to or at the beginning of formal training. This suggests the importance of innate ability in giftedness. However, researchers have also found that individuals with world-class status in the arts, mathematics, science, and sports all report strong family support and years of training and practice (Bloom, 1985). Deliberate practice is an important characteristic of individuals who become experts in a particular domain. For example, in one study the best musicians engaged in twice as much deliberate practice over their lives as did the least successful ones (Ericsson, Krampe, & Tesch-Romer, 1993).

Domain-Specific Giftedness and Development Individuals who are highly gifted are typically not gifted in many domains and research on giftedness is increasingly focused on domain-specific developmental trajectories (Matthews, 2009; Matthews, Subotnik, & Horowitz, 2009; Sternberg, 2010f; Winner, 2009). During the childhood years, the domain(s) in which individuals are gifted usually

At 2 years of age, art prodigy Alexandra Nechita colored in coloring books for hours and also took up pen and ink. She had no interest in dolls or friends. By age 5 she was using watercolors. Once she started school, she would start painting as soon as she got home. At the age of 8, in 1994, she saw the first public exhibit of her work. In succeeding years, working quickly and impulsively on canvases as large as 5 feet by 9 feet, she has completed hundreds of paintings, some of which sell for close to $100,000 apiece. As a teenager, she continues to paint—relentlessly and passionately. It is, she says, what she loves to do. *What are some characteristics of children who are gifted?*

organic retardation Mental retardation that is caused by a genetic disorder or brain damage.

cultural-familial retardation Retardation that is characterized by no evidence of organic brain damage, but the individual's IQ is generally between 50 and 70.

gifted Having above-average intelligence (an IQ of 130 or higher) and/or superior talent for something.

A young Bill Gates, founder of Microsoft and now one of the world's richest people. Like many highly gifted students, Gates was not especially fond of school. He hacked a computer security system when he was 13 and as a high school student, he was allowed to take some college math classes. He dropped out of Harvard University and began developing a plan for what was to become Microsoft Corporation. *What are some ways that schools can enrich the education of such highly talented students as Gates to make it a more challenging, interesting, and meaningful experience?*

emerges. Thus, at some point in the childhood years the child who is to become a gifted artist or the child who is to become a gifted mathematician begins to show expertise in that domain. Regarding domain-specific giftedness, software genius Bill Gates (1998), the founder of Microsoft and one of the world's richest persons, commented that sometimes you have to be careful when you are good at something and resist the urge to think that you will be good at everything. Gates says that because he has been so successful at software development, people expect him to be brilliant about other domains about which he is far from being a genius.

Identification of an individual's domain-specific talent and providing the individual individually appropriate and optional educational opportunities needs to be accomplished at the very latest by adolescence (Keating, 2009). During adolescence, individuals who are talented become less reliant on parental support and increasingly pursue their own interests.

Education of Children Who Are Gifted An increasing number of experts argue that the education of children who are gifted in the United States requires a significant overhaul (Jarvin & others, 2008; Sternberg, 2009f). Ellen Winner (1996, 2006) argues that too often children who are gifted are socially isolated and underchallenged in the classroom. It is not unusual for them to be ostracized and labeled "nerds" or "geeks." Many eminent adults report that school was a negative experience for them, that they were bored and sometimes knew more than their teachers (Bloom, 1985). Winner argues that American education will benefit when standards are raised for all children. When some children are still underchallenged, she recommends that they be allowed to attend advanced classes in their domain of exceptional ability such as allowing some especially precocious middle school students to take college classes in their area of expertise. For example, Bill Gates took college math classes at 13; Yo-Yo Ma, a famous cellist, graduated from high school at 15 and attended Juilliard School of Music in New York City.

Review *Connect* Reflect

LG3 Explain cognitive changes in middle and late childhood.

Review

- What characterizes Piaget's stage of concrete operational thought? What are some contributions and criticisms of Piaget?
- How do children process information in the middle and late childhood years?
- What is intelligence, and how is it assessed? What characterizes links between neuroscience and intelligence? What determines individual and group differences in IQ scores?
- What are the key characteristics of mental retardation and giftedness?

Connect

- In discussing memory, thinking, and intelligence, the topic of recommended education strategies often came up. Compare these recommendations to those you learned about in the "Early Childhood Education" section of Chapter 7.

Reflect *Your Own Personal Journey of Life*

- A CD-ROM, *Children's IQ and Achievement Test*, now lets parents test their child's IQ and how well the child is performing in relation to their grade in school. Would you want to personally test your own child's IQ? What might be some problems with parents giving their children an IQ test?

4 Language Development

LG4 Discuss language development in middle and late childhood.

Vocabulary, Grammar, and Metalinguistic Awareness

Reading

Writing

Bilingualism and Second-Language Learning

Children gain new skills as they enter school that make it possible to learn to read and write: These include increased use of language to talk about things that are not physically present, learning what a word is, and learning how to recognize and talk about sounds. They also learn the *alphabetic principle*, that the letters of the alphabet represent sounds of the language.

VOCABULARY, GRAMMAR, AND METALINGUISTIC AWARENESS

During middle and late childhood, changes occur in the way children's mental vocabulary is organized. When asked to say the first word that comes to mind when they hear a word, preschool children typically provide a word that often follows the word in a sentence. For example, when asked to respond to *dog* the young child may say "barks," or to the word *eat* respond with "lunch." At about 7 years of age, children begin to respond with a word that is the same part of speech as the stimulus word. For example, a child may now respond to the word *dog* with "cat" or "horse." To *eat*, they now might say "drink." This is evidence that children now have begun to categorize their vocabulary by parts of speech.

The process of categorizing becomes easier as children increase their vocabulary. Children's vocabulary increases from an average of about 14,000 words at age 6 to an average of about 40,000 words by age 11.

Children make similar advances in grammar (Tager-Flusberg & Zukowski, 2009). During the elementary school years, children's improvement in logical reasoning and analytical skills helps them understand such constructions as the appropriate use of comparatives *(shorter, deeper)* and subjectives ("If you were president . . ."). During the elementary school years, children become increasingly able to understand and use complex grammar, such as the following sentence: *The boy who kissed his mother wore a hat.* They also learn to use language in a more connected way, producing connected discourse. They become able to relate sentences to one another to produce descriptions, definitions, and narratives that make sense. Children must be able to do these things orally before they can be expected to deal with them in written assignments.

These advances in vocabulary and grammar during the elementary school years are accompanied by the development of **metalinguistic awareness,** which is knowledge about language, such as knowing what a preposition is or the ability to discuss the sounds of a language. Metalinguistic awareness allows children "to think about their language, understand what words are, and even define them" (Berko Gleason, 2009, p. 4). It improves considerably during the elementary school years (Pan & Uccelli, 2009). Defining words becomes a regular part of classroom discourse, and children increase their knowledge of syntax as they study and talk about the components of sentences such as subjects and verbs (Meltzi & Ely, 2009).

Children also make progress in understanding how to use language in culturally appropriate ways—a process called pragmatics (Bryant, 2009; Siegal & Surian, 2010). By the time they enter adolescence, most children know the rules for the use of language in everyday contexts—that is, what is appropriate and inappropriate to say.

metalinguistic awareness Refers to knowledge about language, such as knowing what a preposition is or the ability to discuss the sounds of a language.

READING

Before learning to read, children learn to use language to talk about things that are not present; they learn what a word is; and they learn how to recognize sounds and talk about them. Children who begin elementary school with a robust vocabulary have an advantage when it comes to learning to read (Paris & Paris, 2006). A fluent vocabulary helps readers access word meaning effortlessly (Beaty, 2009; Cunningham, 2009).

How should children be taught to read? Currently, debate focuses on the whole-language approach versus the phonics approach (Combs, 2010; Tompkins, 2011).

The **whole-language approach** stresses that reading instruction should parallel children's natural language learning. In some whole-language classes, beginning readers are taught to recognize whole words or even entire sentences, and to use the context of what they are reading to guess at the meaning of words. Reading materials that support the whole-language approach are whole and meaningful—that is, children are given material in its complete form, such as stories and poems, so that they learn to understand language's communicative function. Reading is connected with listening and writing skills. Although there are variations in whole-language programs, most share the premise that reading should be integrated with other skills and subjects, such as science and social studies, and that it should focus on real-world material. Thus, a class might read newspapers, magazines, or books, and then write about and discuss them.

This teacher is helping a student sound out words. Researchers have found that phonics instruction is a key aspect of teaching students to read, especially beginning readers and students with weak reading skills.

In contrast, the **phonics approach** emphasizes that reading instruction should teach basic rules for translating written symbols into sounds. Early phonics-centered reading instruction should involve simplified materials. Only after children have learned correspondence rules that relate spoken phonemes to the alphabet letters that are used to represent them should they be given complex reading materials, such as books and poems (Cunningham & Allington, 2010; Rasinski & Padak, 2008).

Which approach is better? Research suggests that children can benefit from both approaches, but instruction in phonics needs to be emphasized (Meltzi & Ely, 2009; Tompkins, 2011). An increasing number of experts in the field of reading now conclude that direct instruction in phonics is a key aspect of learning to read (Fox, 2010; Mayer, 2008).

Rich Mayer (2008) recently described three cognitive processes involved in being able to read a printed word:

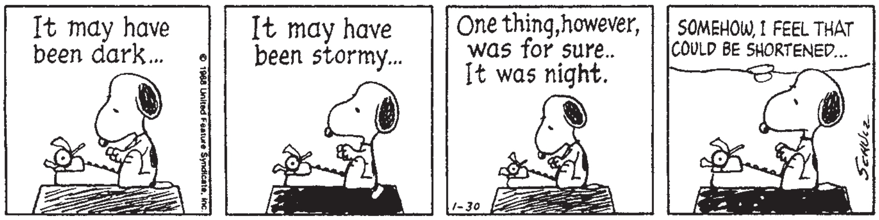
1. *Being aware of sound units in words,* which consists of recognizing phonemes.
2. *Decoding words,* which involves converting printed words into sounds.
3. *Accessing word meaning,* which consists of finding a mental representation of a word's meaning.

whole-language approach An approach to reading instruction based on the idea that instruction should parallel children's natural language learning. Reading materials should be whole and meaningful.

phonics approach The idea that reading instruction should teach the basic rules for translating written symbols into sounds.

WRITING

As they begin to write, children often invent spellings. Parents and teachers should encourage children's early writing but not be overly concerned about the

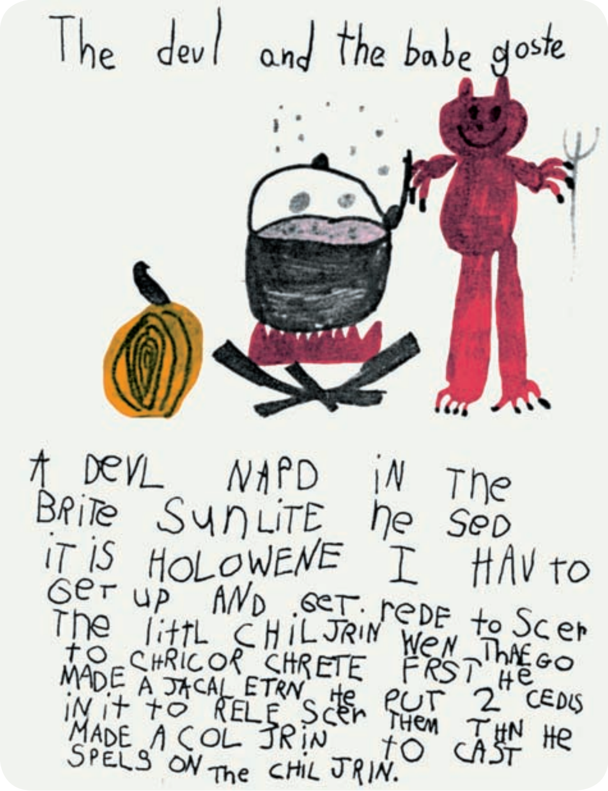

It may have been dark...
© 1968 United Feature Syndicate, Inc.
It may have been stormy...
One thing, however, was for sure.. It was night.
1-30
SOMEHOW, I FEEL THAT COULD BE SHORTENED...
SCHULZ

PEANUTS © United Features Syndicate, Inc.

formation of letters or spelling. Corrections of spelling and printing should be selective and made in positive ways that do not discourage the child's writing and spontaneity.

Like becoming a good reader, becoming a good writer takes many years and lots of practice (Tompkins, 2011). Children should be given many writing opportunities. As their language and cognitive skills improve with good instruction, so will their writing skills. For example, developing a more sophisticated understanding of syntax and grammar serves as an underpinning for better writing. So do such cognitive skills as organization and logical reasoning. Through the course of the school years, students develop increasingly sophisticated methods of organizing their ideas.

Major concerns about students' writing competence are increasingly being voiced (Graham, 2009). One study revealed that 70 to 75 percent of U.S. students in grades 4 through 12 are low-achieving writers (Persky, Dane, & Jin, 2003). College instructors report that 50 percent of high school graduates are not prepared for college-level writing (Achieve, Inc., 2005).


The devl and the babe goste

A DEVL NAPD IN The
BRITE SUNLITE he SED
IT IS HOLOWENE I HAV to
GET UP AND GET. rEDE to SCer
The littL CHILJRIN WEN ThAE GO
to CHRICOR CHRETE FRST HE
MADE A JACAL ETRN He PUT 2 CEDIS
IN it to RELE SCer THEM THN HE
MADE A COL JRIN TO CAST
SPELS ON The CHIL JRIN.

Anna Mudd is the 6-year-old author of "The Devl and the Babe Goste." Anna has been writing stories for at least two years. Her story includes poetic images, sophisticated syntax, and vocabulary that reflect advances in language development.

BILINGUALISM AND SECOND-LANGUAGE LEARNING

Are there sensitive periods in learning a second language? That is, if individuals want to learn a second language, how important is the age at which they begin to learn it? What is the best way to teach children who come from homes in which English is not the primary language?

Second-Language Learning For many years, it was claimed that if individuals did not learn a second language prior to puberty they would never reach native-language learners' proficiency in the second language (Johnson & Newport, 1991). However, recent research indicates a more complex conclusion: Sensitive periods likely vary across different language systems (Thomas & Johnson, 2008). Thus, for late language learners, such as adolescents and adults, new vocabulary is easier to learn than new sounds or new grammar (Neville, 2006). For example, children's ability to pronounce words with a nativelike accent in a second language typically decreases with age, with an especially sharp drop occurring after the age of about 10 to 12. Also, adults tend to learn a second language faster than children, but their final level of second-language attainment is not as high as children's. And the way children and adults learn a second language differs somewhat. Compared with adults, children are less sensitive to feedback, less likely to use explicit strategies, and more likely to learn a second language from large amounts of input (Thomas & Johnson, 2008).

Students in the United States are far behind their counterparts in many developed countries in learning a second language. For example, in Russia, schools have 10 grades, called *forms,* which roughly correspond to the 12 grades in American schools. Russian children begin school at age 7 and begin learning English in the third form. Because of this emphasis on teaching English, most Russian citizens under the age of 40 today are able to speak at least some English. The United States is the only technologically advanced Western nation that does not have a national foreign language requirement at the high school level, even for students in rigorous academic programs.

U.S. students who do not learn a second language may be missing more than the chance to acquire a skill. *Bilingualism*—the ability to speak two languages—has a positive effect on children's cognitive development. Children who are fluent in two languages perform better than their single-language counterparts on tests of control of attention, concept formation, analytical reasoning, cognitive flexibility, and cognitive complexity (Bialystok, 2001, 2007; Bialystok & Craik, 2010). They also are more conscious of the structure of spoken and written language and better at noticing errors of grammar and meaning, skills that benefit their reading ability (Bialystok, 1997). However, a research review concluded that bilingual children have lower formal language proficiency (lower vocabulary, for example) than monolingual children (Bialystok & Craik, 2010).

In the United States, many immigrant children go from being monolingual in their home language to bilingual in that language and in English, only to end up monolingual speakers of English. This is called *subtractive bilingualism,* and it can have negative effects on children, who often become ashamed of their home language.

Bilingual Education A current controversy related to bilingualism involves the millions of U.S. children who come from homes in which English is not the primary language (Diaz-Rico & Weed, 2010; Herrera & Murry, 2011; Ariza & Lapp, 2011). The controversy concerns questions about the best way to teach these children.

For the last two decades, the preferred strategy has been *bilingual education,* which teaches academic subjects to immigrant children in their native language while slowly teaching English (Haley, 2010; Peregoy & Boyle, 2009). Advocates of bilingual education programs argue that if children who do not know English are taught only in English, they will fall behind in academic subjects. How, they ask, can 7-year-olds learn arithmetic or history taught only in English when they do not speak the language?

Some critics of bilingual programs argue that too often it is thought that immigrant children need only one year of bilingual education. However, most immigrant children take approximately three to five years to develop speaking proficiency and seven years to develop reading proficiency in English (Hakuta, Butler, & Witt, 2000). Also, immigrant children of course vary in their ability to learn English. Children who come from lower socioeconomic backgrounds have more difficulty than those from higher socioeconomic backgrounds (Hakuta, 2001). Thus, especially for immigrant children from low socioeconomic backgrounds, more years of bilingual education may be needed than they currently are receiving.

Critics who oppose bilingual education argue that as a result of these programs, the children of immigrants are not learning English, which puts them at a permanent disadvantage in U.S. society. What have researchers found regarding outcomes of bilingual education programs? Drawing conclusions about the effectiveness of bilingual education programs is difficult because of variations across programs in the number of years they are in effect, type of instruction, qualities of schooling other than bilingual education, teachers, children, and other factors. Further, no experiments that compare bilingual education with English-only education in the United States have been effectively conducted (Snow & Kang, 2006).

A first- and second-grade bilingual English-Cantonese teacher instructing students in Chinese in Oakland, California. *What have researchers found about the effectiveness of bilingual education?*

connecting with careers

Salvador Tamayo, Bilingual Education Teacher

Salvador Tamayo teaches bilingual education in the fifth grade at Turner Elementary School in West Chicago. He recently was given a National Educator Award by the Milken Family Foundation for his work in bilingual education classes. He and his students have created several award-winning Web sites about the West Chicago City Museum, the local Latino community, and the history of West Chicago. His students also developed an "I Want to Be an American Citizen" Web site to assist family and community members in preparing for the U.S. citizenship test. Tamayo also teaches a bilingual education class at Wheaton College.

For more information about what elementary school teachers do, see page 45 in the Careers in Life-Span Development appendix.

Salvador Tamayo working with bilingual education students.

Research supports bilingual education in that (1) children have difficulty learning a subject when it is taught in a language they do not understand, and (2) when both languages are integrated in the classroom, children learn the second language more readily and participate more actively (Gonzales, Yawkey, & Minaya-Rowe, 2006; Hakuta, 2001, 2005). To read about the work of one bilingual education teacher, see *Connecting With Careers*.

Review *Connect* Reflect

LG4 Discuss language development in middle and late childhood.

Review

- What are some changes in vocabulary and grammar in the middle and late childhood years?
- What controversy characterizes how to teach children to read?
- What characterizes children's writing skills and their development?
- What is bilingual education? What issues are involved in bilingual education?

Connect

- Earlier in the chapter you learned about metacognition. Compare that with metalinguistic awareness.

Reflect *Your Own Personal Journey of Life*

- Did you learn a second language as a child? If so, do you think it was beneficial to you? If so, how? If you did not learn a second language as a child, do you wish you had? Why or why not?

topical connections

The slow physical growth of middle and late childhood gives way to the dramatic changes of puberty in early adolescence. Significant changes also occur in the adolescent's brain in which earlier maturation of the amygdala (emotion processing) and later maturation of the prefrontal cortex (decision making, self-regulation) is likely linked to an increase in risk-taking and sensation seeking. Sexual development is a normal aspect of adolescent development but having sexual intercourse early in adolescence is associated with a number of problems. Adolescence is critical juncture in health because many poor health habits begin in adolescence. Despite recent declines, the United States has one of the highest rates of illicit drug use of any developed nation. Adolescent thought is more abstract, idealistic, and logical than children's. The transition to middle school or junior high is difficult for many individuals because it coincides with so many physical, cognitive, and socioemotional changes in development.

looking ***forward***

reach your **learning goals**

Physical and Cognitive Development in Middle and Late Childhood

1 Physical Changes and Health

LG1 Describe physical changes and health in middle and late childhood.

Body Growth and Change	The period of middle and late childhood involves slow, consistent growth. During this period, children grow an average of 2 to 3 inches a year. Muscle mass and strength gradually increase. Among the most pronounced changes in body growth and proportion are decreases in head circumference and waist circumference in relation to body height.
The Brain	Changes in the brain in middle and late childhood included advances in functioning in the prefrontal cortex, which are reflected in improved attention, reasoning, and cognitive control. During middle and late childhood, less diffusion and more focal activation occurs in the prefrontal cortex, a change that is associated with an increase in cognitive control.
Motor Development	During the middle and late childhood years, motor development becomes much smoother and more coordinated. Children gain greater control over their bodies and can sit and attend for longer periods of time. However, their lives should be activity-oriented and very active. Increased myelination of the central nervous system is reflected in improved motor skills. Improved fine motor skills appear in the form of handwriting development. Boys are usually better at gross motor skills, girls at fine motor skills.
Exercise	Most American children do not get nearly enough exercise. Parents play an especially important role in guiding children to increase their exercise. Heavy television and computer use are linked to lower activity levels in children.

Health, Illness, and Disease

- For the most part, middle and late childhood is a time of excellent health. The most common cause of severe injury and death in childhood is motor vehicle accidents. Being overweight is an increasing child health problem, raising the risk for many medical and psychological problems. Obesity in children poses serious health risks. Cardiovascular disease is uncommon in children but the precursors to adult cardiovascular disease are often already apparent in children. Cancer is the second leading cause of death in children (after accidents). Leukemia is the most common childhood cancer.

2 Children With Disabilities

LG2 Identify children with different types of disabilities and issues in educating them.

The Scope of Disabilities

- Approximately 14 percent of U.S. children from 3 to 21 years of age receive special education or related services. A child with a learning disability has difficulty in learning that involves understanding or using spoken or written language and the difficulty can appear in listening, thinking, reading, writing, and spelling. A learning disability also may involve difficulty in doing mathematics. To be classified as a learning disability, the learning problem is not primarily the result of visual, hearing, or motor disabilities; mental retardation; emotional disorders; or due to environmental, cultural, or economic disadvantage. Dyslexia is a category of learning disabilities that involves a severe impairment in the ability to read and spell. Dysgraphia is a learning disability that involves having difficulty in handwriting. Dyscalculia is a learning disability that involves difficulties in math computation. Attention deficit hyperactivity disorder (ADHD) is a disability in which individuals consistently show problems in one or more of these areas: (1) inattention, (2) hyperactivity, and (3) impulsivity. ADHD has been increasingly diagnosed. Emotional and behavioral disorders consist of serious, persistent problems that involve relationships, aggression, depression, fears associated with personal or school matters, as well as other inappropriate socioemotional characteristics. Autism spectrum disorders (ASD), also called pervasive developmental disorders, range from autistic disorder, a severe developmental disorder, to Asperger syndrome, a relatively mild autism spectrum disorder. The current consensus is that autism is a brain dysfunction with abnormalities in brain structure and neurotransmitters. Children with autism spectrum disorders are characterized by problems in social interaction, verbal and nonverbal communication, and repetitive behaviors.

Educational Issues

- In 1975, Public Law 94-142, the Education for All Handicapped Children Act, required that all children with disabilities be given a free, appropriate public education. This law was renamed the Individuals with Disabilities Education Act (IDEA) in 1990 and updated in 2004. IDEA includes requirements that children with disabilities receive an individualized education plan (IEP), which is a written plan that spells out a program tailored to the child, and that they be educated in the least restrictive environment (LRE), which is a setting that is as similar as possible to the one in which children without disabilities are educated. The term inclusion means educating children with disabilities full-time in the regular classroom.

3 Cognitive Changes

LG3 Explain cognitive changes in middle and late childhood.

Piaget's Cognitive Developmental Theory

- Piaget said that the stage of concrete operational thought characterizes children from about 7 to 11 years of age. During this stage, children are capable of concrete operations, conservation, classification, seriation, and transitivity. Critics argue that some abilities emerge earlier than Piaget thought, that elements of a stage do not appear at the same time, and that education and culture have more influence on development than Piaget predicted. Neo-Piagetians place more emphasis on how children process information, strategies, speed of information processing, and the division of cognitive problems into more precise steps.

Information Processing

- Long-term memory increases in middle and late childhood. Knowledge and expertise influence memory. Strategies can be used by children to improve their memory and it is important for adults who instruct children to encourage children's strategy use. Fuzzy trace theory has been proposed to explain developmental changes in memory. Critical thinking involves thinking reflectively and productively, as well as evaluating the evidence. Mindfulness is an important aspect of critical thinking. A special concern is the lack of emphasis on critical thinking in many schools. Creative thinking is the ability to think in novel and unusual ways and to come up with unique solutions to problems. Guilford distinguished between convergent and divergent thinking. A number of strategies can be used to encourage children's creative thinking, including brainstorming. Children think like scientists in some ways, but in others they don't. Metacognition is knowing about knowing. Many metacognitive studies have focused on metamemory. Pressley views the key to education as helping students learn a rich repertoire of strategies.

Intelligence

- Intelligence consists of problem-solving skills and the ability to adapt to and learn from life's everyday experiences. Interest in intelligence often focuses on individual differences and assessment. Widely used intelligence tests today include the Stanford-Binet tests and Wechsler scales. Results on these tests may be reported in terms of an overall IQ or in terms of performance on specific areas of the tests. Sternberg proposed that intelligence comes in three main forms: analytical, creative, and practical. Gardner proposes that there are eight types of intelligence: verbal, mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, musical, and naturalist. The multiple-intelligence approaches have expanded our conception of intelligence, but critics argue that the research base for these approaches is not well established. IQ scores are influenced by both genetics and characteristics of the environment. Parents, home environments, schools, and intervention programs can influence these scores. Intelligence test scores have risen considerably around the world in recent decades—called the Flynn effect—and this supports the role of environment in intelligence. Group differences in IQ scores may reflect many influences, including cultural bias. Tests may be biased against certain groups because they are not familiar with a standard form of English, with the content tested, or with the testing situation. Tests are likely to reflect the values and experience of the dominant culture.

Extremes of Intelligence

- Mental retardation involves low IQ and problems in adapting to everyday life. One classification of mental retardation distinguishes organic and cultural-familial retardation. Individuals who are gifted have above-average intelligence (an IQ of 130 or higher) and/or superior talent for something. Three characteristics of gifted children are precocity, marching to their own drummer, and a passion to master their domain. Giftedness is likely a consequence of both heredity and environment. Developmental changes characterize giftedness and increasingly the domain-specific aspect of giftedness is emphasized. Concerns exist about the education of children who are gifted.

4 Language Development

LG4 Discuss language development in middle and late childhood.

Vocabulary, Grammar, and Metalinguistic Awareness

- Children become more analytical and logical in their approach to words and grammar. In terms of grammar, children now better understand comparatives and subjectives. They become increasingly able to use complex grammar and produce narratives that make sense. Improvements in metalinguistic awareness—knowledge about language—are evident during the elementary school years as children increasingly define words, increase their knowledge of syntax, and understand better how to use language in culturally appropriate ways.

Reading

- A current debate in reading focuses on the phonics approach versus the whole-language approach. The phonics approach advocates phonetics instruction and giving children simplified materials. The whole-language approach stresses that reading instruction should parallel children's natural language learning and giving children whole-language materials, such as books and poems. Three key processes in learning to read a printed word are: being aware of sound units in words; decoding words; and accessing word meaning.

Writing

- Advances in children's language and cognitive development provide the underpinnings for improved writing. Major concerns are increasingly being voiced about children's writing competence. Teachers play a key role in improving children's writing skills.

Bilingualism and Second-Language Learning

- Recent research indicates a complex conclusion about whether there are sensitive periods in learning a second language. Bilingual education aims to teach academic subjects to immigrant children in their native languages while gradually adding English instruction. Researchers have found that bilingualism does not interfere with performance in either language.

key **terms**

learning disability 283
dyslexia 283
dysgraphia 283
dyscalculia 283
attention deficit hyperactivity disorder (ADHD) 284
emotional and behavioral disorders 285
autism spectrum disorders (ASD) 285
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chapter 10

SOCIOEMOTIONAL DEVELOPMENT IN MIDDLE AND LATE CHILDHOOD

chapter **outline**

1 Emotional and Personality Development

Learning Goal 1 Discuss emotional and personality development in middle and late childhood.

The Self
Emotional Development
Moral Development
Gender

2 Families

Learning Goal 2 Describe developmental changes in parent-child relationships, parents as managers, and societal changes in families.

Developmental Changes in Parent-Child Relationships
Parents as Managers
Stepfamilies

3 Peers

Learning Goal 3 Identify changes in peer relationships in middle and late childhood.

Developmental Changes
Peer Status
Social Cognition
Bullying
Friends

4 Schools

Learning Goal 4 Characterize aspects of schooling in children's development in middle and late childhood.

Contemporary Approaches to Student Learning
Socioeconomic Status, Ethnicity, and Culture

In *The Shame of the Nation,* Jonathan Kozol (2005) described his visits to 60 U.S. schools in urban low-income areas in 11 states. He saw many schools in which minorities totaled 80 to 90 percent of the student population. Kozol observed numerous inequities—unkempt classrooms, hallways, and restrooms; inadequate textbooks and supplies; and lack of resources. He also saw teachers mainly instructing students to memorize material by rote, especially as preparation for mandated tests, rather than stimulating them to engage in higher-level thinking. Kozol also frequently observed teachers using threatening disciplinary tactics to control the classroom.

However, some teachers Kozol observed were effective in educating children in these undesirable conditions. At P.S. 30 in the South Bronx, Mr. Bedrock teaches fifth grade. One student in his class, Serafina, recently lost her mother to AIDS. When author Jonathan Kozol visited the class, he was told that two other children had taken the role of "allies in the child's struggle for emotional survival" (Kozol, 2005, p. 291). Textbooks are in short supply for the class, and the social studies text is so out of date it claims that Ronald Reagan is the country's president. But Mr. Bedrock told Kozol that it's a "wonderful" class this year. About their teacher, 56-year-old Mr. Bedrock, one student said, "'He's getting old, . . . but we love him anyway'" (p. 292). Kozol observed the students in his class to be orderly, interested, and engaged.

What are some of the challenges faced by children growing up in the South Bronx?

topical **connections**

In early childhood, according to Erikson, young children are in the stage of initiative versus guilt. Parents continue to play an important role in their development and a style of authoritative parenting is most likely to have positive outcomes for children. In early childhood, peer relations take on a more significant role as children's social worlds widen. Play has a special place in young children's lives and is an important context for both cognitive and socioemotional development.

looking ***back***

preview

The years of middle and late childhood bring many changes to children's social and emotional lives. Transformations in their relationships with parents and peers occur, and schooling takes on a more academic flavor. The development of their self-conceptions, moral reasoning, and moral behavior is also substantial.

1 Emotional and Personality Development

LG1 Discuss emotional and personality development in middle and late childhood.

The Self
Emotional Development
Moral Development
Gender

In this section, we will explore how the self continues to develop during middle and late childhood and the emotional changes that take place during these years. We will also discuss children's moral development and many aspects of the role that gender plays in their development in middle and late childhood.

THE SELF

What is the nature of the child's self-understanding, understanding of others, and self-esteem during the elementary school years? What role do self-efficacy and self-regulation play in children's achievement?

The Development of Self-Understanding In middle and late childhood, especially from 8 to 11 years of age, children increasingly describe themselves with psychological characteristics and traits in contrast to the more concrete self-descriptions of younger children. Older children are more likely to describe themselves as "*popular, nice, helpful, mean, smart,* and *dumb*" (Harter, 2006, p. 526).

In addition, during the elementary school years, children become more likely to recognize social aspects of the self (Harter, 2006). They include references to social groups in their self-descriptions, such as referring to themselves as Girl Scouts, as Catholics, or as someone who has two close friends (Livesly & Bromley, 1973).

Children are busy becoming something they have not quite grasped yet, something which keeps changing.

—Alastair Reid
American Poet, 20th Century

Children's self-understanding in the elementary school years also includes increasing reference to social comparison (Davis-Kean, Jager, & Collins, 2009; Harter, 2006). At this point in development, children are more likely to distinguish themselves from others in comparative rather than in absolute terms. That is, elementary-school-age children are no longer as likely to think about what they do or do not do, but are more likely to think about what they can do in comparison with others.

Consider a series of studies in which Diane Ruble (1983) investigated children's use of social comparison in their self-evaluations. Children were given a difficult task and then offered feedback on their performance, as well as information about the performances of other children their age. The children were then asked for self-evaluations. Children younger than 7 made virtually no reference to the information about other children's performances. However, many children older than 7 included socially comparative information in their self-descriptions.

developmental **connection**

Identity. In adolescence, individuals become more introspective and reflective in their self-understanding as they search for an identity. Chapter 12, p. 383

In sum, in middle and late childhood, self-description increasingly involves psychological and social characteristics, including social comparison.

Understanding Others In Chapter 8, we described the advances and limitations of young children's understanding of others. In middle and late childhood, children show an increase in **perspective taking,** the ability to assume other people's perspectives and understand their thoughts and feelings. In Robert Selman's (1980)

perspective taking The ability to assume other people's perspectives and understand their thoughts and feelings.

view, at about 6 to 8 years of age, children begin to understand that others may have a perspective because some people have more access to information. Then, he says, in the next several years, children become aware that each individual is aware of the other's perspective and that putting one's self in the other's place is a way of judging the other person's intentions, purposes, and actions.

Perspective taking is especially thought to be important in whether children develop prosocial or antisocial attitudes and behavior (Davis-Kean, Jager, & Collins, 2010). In terms of prosocial behavior, taking another's perspective improves children's likelihood of understanding and sympathizing with others when they are distressed or in need (Eisenberg, Fabes, & Spinrad, 2006). In terms of antisocial behavior, some researchers have found that children who have a low level of perspective-taking skills engage in more antisocial behavior than children at higher levels (Chandler, 1973).

What are some changes in children's understanding of others in middle and late childhood?

In middle and late childhood, children also become more skeptical of others' claims. In Chapter 8, we indicated that even 4-year-old children show some skepticism of others' claims. In middle and late childhood, children become increasingly skeptical of some sources of information about psychological traits. For example, in one study 10- to 11-year-olds were more likely to reject other children's self-reports that they were *smart* and *honest* than were 6- to 7-year-olds (Heyman & Legare, 2005). The more psychologically sophisticated 10- to 11-year-olds also showed a better understanding that others' self-reports may involve socially desirable tendencies than the 6- to 7-year-olds.

Self-Esteem and Self-Concept High self-esteem and a positive self-concept are important characteristics of children's well-being (Kaplan, 2009). Investigators sometimes use the terms *self-esteem* and *self-concept* interchangeably or do not precisely define them, but there is a meaningful difference between them. **Self-esteem** refers to global evaluations of the self; it is also called *self-worth* or *self-image*. For example, a child may perceive that she is not merely a person but a *good* person. **Self-concept** refers to domain-specific evaluations of the self. Children can make self-evaluations in many domains of their lives—academic, athletic, appearance, and so on. In sum, *self-esteem* refers to global self-evaluations, *self-concept* to domain-specific evaluations.

Self-esteem reflects perceptions that do not always match reality (Baumeister & others, 2003). A child's self-esteem might reflect a belief about whether he or she is intelligent and attractive, for example, but that belief is not necessarily accurate. Thus, high self-esteem may refer to accurate, justified perceptions of one's worth as a person and one's successes and accomplishments but it can also refer to an arrogant, grandiose, unwarranted sense of superiority over others (Krueger, Vohs, & Baumeister, 2008). In the same manner, low self-esteem may reflect either an accurate perception of one's shortcomings or a distorted, even pathological insecurity and inferiority.

What are some issues involved in understanding children's self-esteem in school?

Variations in self-esteem have been linked with many aspects of children's development. However, much of the research is *correlational* rather than *experimental*. Recall from Chapter 1 that correlation does not equal causation. Thus, if a correlational study finds an association between children's low self-esteem and low academic achievement, low academic achievement could cause the low self-esteem as much as low self-esteem could cause the low academic achievement.

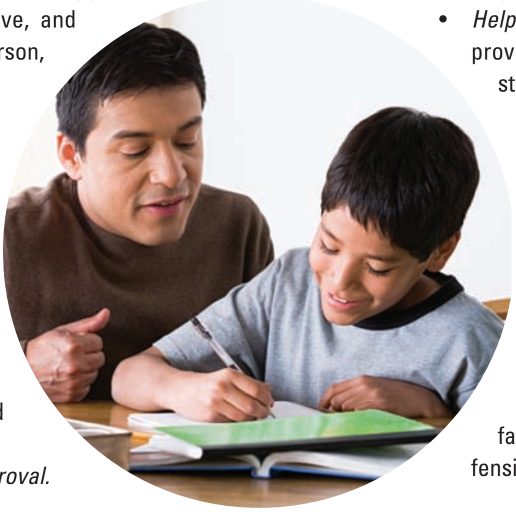
self-esteem The global evaluative dimension of the self. Self-esteem is also referred to as self-worth or self-image.

self-concept Domain-specific evaluations of the self.

connecting development to life

Increasing Children's Self-Esteem

Four ways children's self-esteem can be improved include identifying the causes of low self-esteem, providing emotional support and social approval, helping children achieve, and helping children cope (Bednar, Wells, & Peterson, 1995; Harter, 2006).


How can parents help children develop higher self-esteem?

- *Identify the causes of low self-esteem.* Intervention should target the causes of low self-esteem. Children have the highest self-esteem when they perform competently in domains that are important to them. Therefore, children should be encouraged to identify and value areas of competence. These areas might include academic skills, athletic skills, physical attractiveness, and social acceptance.
- *Provide emotional support and social approval.* Some children with low self-esteem come from conflicted families or conditions in which they experienced abuse or neglect—situations in which support was not available. In some cases, alternative sources of support can be arranged either informally through the encouragement of a teacher, a coach, or another significant adult, or more formally through programs such as Big Brothers Big Sisters.
- *Help children achieve.* Achievement also can improve children's self-esteem. For example, the straightforward teaching of real skills to children often results in increased achievement and, thus, in enhanced self-esteem. Children develop higher self-esteem because they know the important tasks that will achieve their goals, and they have performed them or similar behaviors in the past.
- *Help children cope.* Self-esteem is often increased when children face a problem and try to cope with it, rather than avoid it. If coping rather than avoidance prevails, children often face problems realistically, honestly, and nondefensively. This produces favorable self-evaluative thoughts, which lead to the self-generated approval that raises self-esteem.

Discussed in the "Emotional Development" section of Chapter 8, which parenting approach might help accomplish the last goal mentioned here? How?

In fact, there are only moderate correlations between school performance and self-esteem, and these correlations do not suggest that high self-esteem produces better school performance (Baumeister & others, 2003). Efforts to increase students' self-esteem have not always led to improved school performance (Davies & Brember, 1999).

Children with high self-esteem have greater initiative, but this can produce positive or negative outcomes (Baumeister & others, 2003). High-self-esteem children are prone to both prosocial and antisocial actions (Krueger, Vohs, & Baumeister, 2008). A recent study revealed that over time aggressive children with high self-esteem increasingly valued the rewards that aggression can bring and belittled their victims (Menon & others, 2007).

In addition, a current concern is that too many of today's children grow up receiving praise for mediocre or even poor performance and as a consequence have inflated self-esteem (Graham, 2005; Stipek, 2005). They may have difficulty handling competition and criticism. This theme is vividly captured by the title of a book, *Dumbing Down Our Kids: Why American Children Feel Good About Themselves But Can't Read, Write, or Add* (Sykes, 1995).

What are some good strategies for effectively increasing children's self-esteem? See *Connecting Development to Life* for some answers to this question.

self-efficacy The belief that one can master a situation and produce favorable outcomes.

Self-Efficacy **Self-efficacy** is the belief that one can master a situation and produce favorable outcomes. Albert Bandura (2001, 2008, 2009a, b; 2010a), whose social cognitive theory we described in Chapter 1, states that self-efficacy is a critical factor in whether or not students achieve. Self-efficacy is the belief that "I can"; helplessness is the belief that "I cannot". Students with high self-efficacy endorse such statements as "I know that I will be able to learn the material in this class" and "I expect to be able to do well at this activity."

Dale Schunk (2011) has applied the concept of self-efficacy to many aspects of students' achievement. In his view, self-efficacy influences a student's choice of activities. Students with low self-efficacy for learning may avoid many learning tasks, especially those that are challenging. By contrast, high-self-efficacy counterparts eagerly work at learning tasks (Schunk, 2011). Students with high self-efficacy are more likely to expend effort and persist longer at a learning task than students with low self-efficacy.

What characterizes Erikson's stage of industry versus inferiority?

Self-Regulation One of the most important aspects of the self in middle and late childhood is the increased capacity for self-regulation. This increased capacity is characterized by deliberate efforts to manage one's behavior, emotions, and thoughts, leading to increased social competence and achievement (Eisenberg, Spinrad, & Eggum, 2010; Thompson, 2009a). A recent study found that self-control increased from 4 years of age to 10 years of age and that high self-control was linked to lower levels of deviant behavior (Vazsonyi & Huang, 2010). In this study, parenting characterized by warmth and positive affect predicted the developmental increase in self-control. Another recent study revealed that children from low-income families who had a higher level of self-regulation made better grades in school than their counterparts who had a lower level of self-regulation (Buckner, Mezzacappa, & Beardslee, 2009).

The increased capacity in self-regulation is linked to developmental advances in the brain's prefrontal cortex, which was discussed in Chapter 9, "Physical and Cognitive Development in Middle and Late Childhood." Recall our discussion there of the increased focal activation in the prefrontal cortex that is linked to improved cognitive control, which includes self-regulation (Diamond, Casey, & Munakata, 2011; Durston & others, 2006).

Industry Versus Inferiority In Chapter 1, we described Erik Erikson's (1968) eight stages of human development. His fourth stage, industry versus inferiority, appears during middle and late childhood. The term *industry* expresses a dominant theme of this period: Children become interested in how things are made and how they work. When children are encouraged in their efforts to make, build, and work—whether building a model airplane, constructing a tree house, fixing a bicycle, solving an addition problem, or cooking—their sense of industry increases. However, parents who see their children's efforts at making things as "mischief" or "making a mess" encourage children's development of a sense of inferiority.

Children's social worlds beyond their families also contribute to a sense of industry. School becomes especially important in this regard. Consider children who are slightly below average in intelligence. They are too bright to be in special classes but not bright enough to be in gifted classes. They fail frequently in their academic efforts, developing a sense of inferiority. By contrast, consider children whose sense of industry is derogated at home. A series of sensitive and committed teachers may revitalize their sense of industry (Elkind, 1970).

developmental **connection**

Cognitive Theory. Initiative versus guilt is Erikson's early childhood stage and identity versus identity confusion is his adolescence stage. Chapter 8, p. 243; Chapter 12, p. 384

EMOTIONAL DEVELOPMENT

In Chapter 8, we saw that preschoolers become more adept at talking about their own and others' emotions. They also show a growing awareness of the need to control and manage their emotions to meet social standards. In middle and late childhood, children further develop their understanding and self-regulation of emotion (Cunningham, Kliwer, & Garner, 2009; Saarni & others, 2006).

What are some changes in emotion during the middle and late childhood years?

Developmental Changes Developmental changes in emotions during the middle and late childhood years include the following (Denham, Bassett, & Wyatt, 2007; Kuebli, 1994; Thompson, 2009a; Thompson & Goodvin, 2005):

- *Improved emotional understanding.* For example, children in elementary school develop an increased ability to understand such complex emotions as pride and shame. These emotions become less tied to the reactions of other people; they become more self-generated and integrated with a sense of personal responsibility.
- *Increased understanding that more than one emotion can be experienced in a particular situation.* A third-grader, for example, may realize that achieving something might involve both anxiety and joy.
- *Increased tendency to be aware of the events leading to emotional reactions.* A fourth-grader may become aware that her sadness today is influenced by her friend moving to another town last week.
- *Ability to suppress or conceal negative emotional reactions.* A fifth-grader has learned to tone down his anger better than he used to when one of his classmates irritates him.
- *The use of self-initiated strategies for redirecting feelings.* In the elementary school years, children become more reflective about their emotional lives and increasingly use strategies to control their emotions. They become more effective at cognitively managing their emotions, such as soothing oneself after an upset.
- *A capacity for genuine empathy.* For example, a fourth-grader feels sympathy for a distressed person and experiences vicariously the sadness the distressed person is feeling.

Coping With Stress An important aspect of children's emotional lives is learning how to cope with stress (Swearer, Givens, & Frerichs, 2010). As children get older, they more accurately appraise a stressful situation and determine how much control they have over it. Older children generate more coping alternatives to stressful conditions and use more cognitive coping strategies (Saarni & others, 2006). They are better than younger children at intentionally shifting their thoughts to something that is less stressful; and at reframing, or changing one's perception of a stressful situation. For example, a younger child may be very disappointed that a teacher did not say hello when the child arrived in the classroom. An older child may reframe the situation and think, "My teacher may have been busy with other things and just forgot to say hello."

By 10 years of age, most children are able to use these cognitive strategies to cope with stress (Saarni, 1999). However, in families that have not been supportive and are characterized by turmoil or trauma, children may be so overwhelmed by stress that they do not use such strategies (Klingman, 2006).

developmental **connection**

Biological Processes. In older adults, stress hormones stay elevated in the bloodstream longer, which can accelerate aging and harm immune system functioning. Chapter 17, p. 538

Disasters can especially harm children's development and produce adjustment problems. Among the outcomes for children who experience disasters are acute stress reactions, depression, panic disorder, and post-traumatic stress disorder (Kar, 2009). Proportions of children developing these problems following a disaster depend on such factors as the nature and severity of the disaster, as well as the support available to the children. The terrorist attacks on the World Trade Center in New York City and the Pentagon in Washington, D.C., on September 11, 2001, and hurricanes Katrina and Rita in September 2005, raised special concerns about how to help children cope with such stressful events (Osofsky, 2007).

Researchers have offered some recommendations for parents, teachers, and other adults caring for children (Gurwitch & others, 2001, pp. 4–11):

- Reassure children (numerous times, if necessary) of their safety and security.
- Allow children to retell events and be patient in listening to them.
- Encourage children to talk about any disturbing or confusing feelings, reassuring them that such feelings are normal after a stressful event.

What are some effective strategies to help children cope with traumatic events, such as the terrorist attacks on the United States on 9/11/2001, and hurricane Katrina in September 2005?

- Protect children from reexposure to frightening situations and reminders of the trauma—for example, by limiting discussion of the event in front of the children.
- Help children make sense of what happened, keeping in mind that children may misunderstand what took place. For example, young children "may blame themselves, believe things happened that did not happen, believe that terrorists are in the school, etc. Gently help children develop a realistic understanding of the event" (p. 10).

Traumatic events may cause individuals to think about the moral aspects of life. Hopelessness and despair may short-circuit moral development when a child is confronted by the violence of war zones and impoverished inner cities (Nader, 2001). Let's further explore children's moral development.

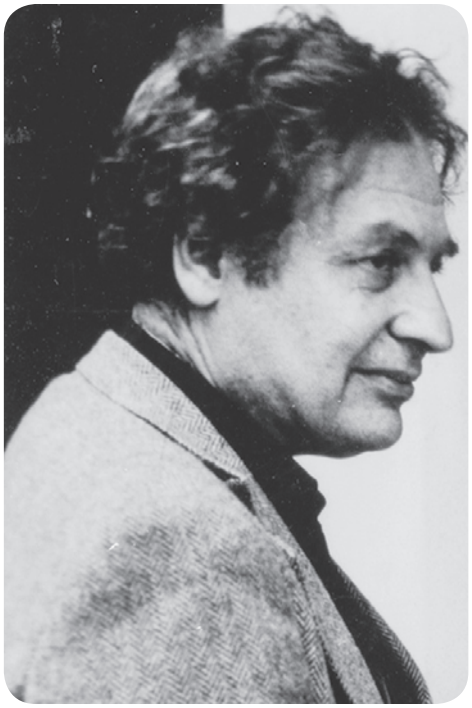
MORAL DEVELOPMENT

Remember from Chapter 8 our description of Piaget's view of moral development. Piaget proposed that younger children are characterized by heteronomous morality—but that by 10 years of age they have moved into a higher stage called autonomous morality. According to Piaget, older children consider the intentions of the individual, believe that rules are subject to change, and are aware that punishment does not always follow wrongdoing.

A second major perspective on moral development was proposed by Lawrence Kohlberg (1958, 1986). Piaget's cognitive stages of development serve as the underpinnings for Kohlberg's theory, but Kohlberg suggested that there are six stages of moral development. These stages, he argued, are universal. Development from one stage to another, said Kohlberg, is fostered by opportunities to take the perspective of others and to experience conflict between one's current stage of moral thinking and the reasoning of someone at a higher stage.

Kohlberg arrived at his view after 20 years of using a unique interview with children. In the interview, children are presented with a series of stories in which characters face moral dilemmas. The following is the most popular Kohlberg dilemma:

> In Europe a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist



Lawrence Kohlberg, the architect of a provocative cognitive developmental theory of moral development. *What is the nature of his theory?*

LEVEL 1

Preconventional Level
No Internalization

Stage 1
Heteronomous Morality

Individuals pursue their own interests but let others do the same. What is right involves equal exchange.

Stage 2
Individualism, Purpose, and Exchange

Children obey because adults tell them to obey. People base their moral decisions on fear of punishment.

LEVEL 2

Conventional Level
Intermediate Internalization

Stage 3
Mutual Interpersonal Expectations, Relationships, and Interpersonal Conformity

Individuals value trust, caring, and loyalty to others as a basis for moral judgments.

Stage 4
Social System Morality

Moral judgments are based on understanding and the social order, law, justice, and duty.

LEVEL 3

Postconventional Level
Full Internalization

Stage 5
Social Contract or Utility and Individual Rights

Individuals reason that values, rights, and principles undergird or transcend the law.

Stage 6
Universal Ethical Principles

The person has developed moral judgments that are based on universal human rights. When faced with a dilemma between law and conscience, a personal, individualized conscience is followed.

FIGURE **10.1**

KOHLBERG'S THREE LEVELS AND SIX STAGES OF MORAL DEVELOPMENT. Kohlberg argued that people everywhere develop their moral reasoning by passing through these age–based stages. *Where does Kohlberg's theory stand on the nature-nurture and continuity-discontinuity issues discussed in Chapter 1?*

> was charging ten times what the drug cost him to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together $1,000 which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug, and I am going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. (Kohlberg, 1969, p. 379)

This story is one of 11 that Kohlberg devised to investigate the nature of moral thought. After reading the story, the interviewee answers a series of questions about the moral dilemma. Should Heinz have stolen the drug? Was stealing it right or wrong? Why? Is it a husband's duty to steal the drug for his wife if he can get it no other way? Would a good husband steal? Did the druggist have the right to charge that much when there was no law setting a limit on the price? Why or why not?

The Kohlberg Stages

Based on the answers interviewees gave for this and other moral dilemmas, Kohlberg described three levels of moral thinking, each of which is characterized by two stages (see Figure 10.1).

Preconventional reasoning is the lowest level of moral reasoning, said Kohlberg. At this level, good and bad are interpreted in terms of external rewards and punishments.

- *Stage 1.* **Heteronomous morality** is the first stage of preconventional reasoning. At this stage, moral thinking is tied to punishment. For example, children think that they must obey because they fear punishment for disobedience.
- *Stage 2.* **Individualism, instrumental purpose, and exchange** is the second stage of preconventional reasoning. At this stage, individuals reason that pursuing their own interests is the right thing to do but they let others do the same. Thus, they think that what is right involves an equal exchange. They reason that if they are nice to others, others will be nice to them in return.

Conventional reasoning is the second, or intermediate, level in Kohlberg's theory of moral development. At this level, individuals apply certain standards, but they are the standards set by others, such as parents or the government.

- *Stage 3.* **Mutual interpersonal expectations, relationships, and interpersonal conformity** is Kohlberg's third stage of moral development. At this

preconventional reasoning The lowest level in Kohlberg's theory of moral development. The individual's moral reasoning is controlled primarily by external rewards and punishment.

heteronomous morality Kohlberg's first stage of preconventional reasoning in which moral thinking is tied to punishment.

individualism, instrumental purpose, and exchange Kohlberg's second stage of preconventional reasoning. At this stage, individuals pursue their own interests but also let others do the same.

conventional reasoning The second, or intermediate, level in Kohlberg's theory of moral development. At this level, individuals abide by certain standards but they are the standards of others such as parents or the laws of society.

mutual interpersonal expectations, relationships, and interpersonal conformity Kohlberg's third stage of moral development. At this stage, individuals value trust, caring, and loyalty to others as a basis of moral judgments.

stage, individuals value trust, caring, and loyalty to others as a basis of moral judgments. Children and adolescents often adopt their parents' moral standards at this stage, seeking to be thought of by their parents as a "good girl" or a "good boy."

- *Stage 4.* **Social systems morality** is the fourth stage in Kohlberg's theory of moral development. At this stage, moral judgments are based on understanding the social order, law, justice, and duty. For example, adolescents may reason that in order for a community to work effectively, it needs to be protected by laws that are adhered to by its members.

Postconventional reasoning is the highest level in Kohlberg's theory of moral development. At this level, the individual recognizes alternative moral courses, explores the options, and then decides on a personal moral code.

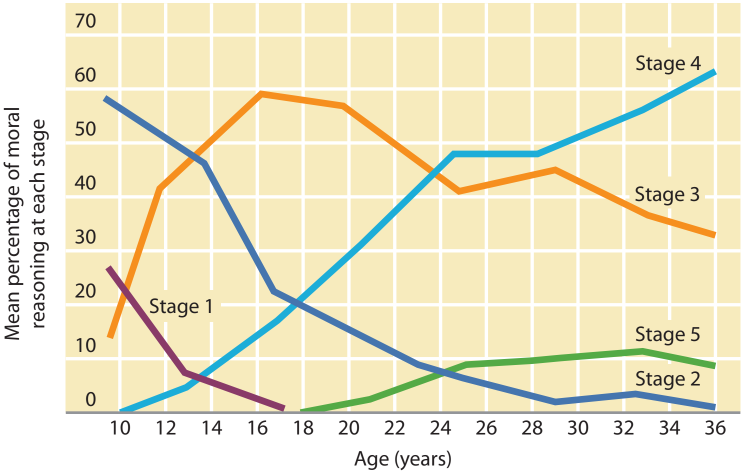


FIGURE **10.2**

AGE AND THE PERCENTAGE OF INDIVIDUALS AT EACH KOHLBERG STAGE. In one longitudinal study of males from 10 to 36 years of age, at age 10 most moral reasoning was at stage 2 (Colby & others, 1983). At 16 to 18 years of age, stage 3 became the most frequent type of moral reasoning, and it was not until the mid-twenties that stage 4 became the most frequent. Stage 5 did not appear until 20 to 22 years of age, and it never characterized more than 10 percent of the individuals. In this study, the moral stages appeared somewhat later than Kohlberg envisioned and stage 6 was absent. *Do you think it matters that all of the participants in this study were males? Why or why not?*

- *Stage 5.* **Social contract or utility and individual rights** is the fifth Kohlberg stage. At this stage, individuals reason that values, rights, and principles undergird or transcend the law. A person evaluates the validity of actual laws, and social systems can be examined in terms of the degree to which they preserve and protect fundamental human rights and values.
- *Stage 6.* **Universal ethical principles** is the sixth and highest stage in Kohlberg's theory of moral development. At this stage, the person has developed a moral standard based on universal human rights. When faced with a conflict between law and conscience, the person reasons that conscience should be followed, even though the decision might bring risk.

Kohlberg maintained that these levels and stages occur in a sequence and are age-related: Before age 9, most children use level 1, preconventional reasoning based on external rewards and punishments, when they consider moral choices. By early adolescence, their moral reasoning is increasingly based on the application of standards set by others. Most adolescents reason at stage 3, with some signs of stages 2 and 4. By early adulthood, a small number of individuals reason in postconventional ways.

What evidence supports this description of development? A 20-year longitudinal investigation found that use of stages 1 and 2 decreased with age (Colby & others, 1983) (see Figure 10.2). Stage 4, which did not appear at all in the moral reasoning of 10-year-olds, was reflected in the moral thinking of 62 percent of the 36-year-olds. Stage 5 did not appear until age 20 to 22 and never characterized more than 10 percent of the individuals.

Thus, the moral stages appeared somewhat later than Kohlberg initially envisioned, and reasoning at the higher stages, especially stage 6, was rare. Although stage 6 has been removed from the Kohlberg moral judgment scoring manual, it still is considered to be theoretically important in the Kohlberg scheme of moral development.

Influences on the Kohlberg Stages What factors influence movement through Kohlberg's stages? Although moral reasoning at each stage presupposes a certain level of cognitive development, Kohlberg argued that advances in children's cognitive development did not ensure development of moral reasoning. Instead, moral reasoning also reflects children's experiences in dealing with moral questions and moral conflict.

Several investigators have tried to advance individuals' levels of moral development by having a model present arguments that reflect moral thinking one stage above the individuals' established levels. This approach applies the concepts of equilibrium and conflict that Piaget used to explain cognitive development. By presenting

social systems morality The fourth stage in Kohlberg's theory of moral development. Moral judgments are based on understanding the social order, law, justice, and duty.

postconventional reasoning The highest level in Kohlberg's theory of moral development. At this level, the individual recognizes alternative moral courses, explores the options, and then decides on a personal moral code.

social contract or utility and individual rights The fifth Kohlberg stage. At this stage, individuals reason that values, rights, and principles undergird or transcend the law.

universal ethical principles The sixth and highest stage in Kohlberg's theory of moral development. Individuals develop a moral standard based on universal human rights.

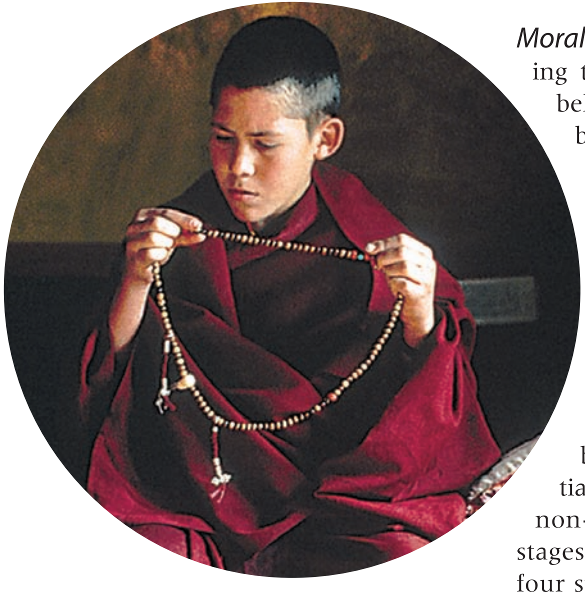
arguments slightly beyond the children's level of moral reasoning, the researchers created a disequilibrium that motivated the children to restructure their moral thought. The upshot of studies using this approach is that virtually any plus-stage discussion, for any length of time, seems to promote more advanced moral reasoning (Walker, 1982).

Kohlberg emphasized that peer interaction and perspective taking are critical aspects of the social stimulation that challenges children to change their moral reasoning. Whereas adults characteristically impose rules and regulations on children, the give-and-take among peers gives children an opportunity to take the perspective of another person and to generate rules democratically. Kohlberg stressed that in principle, encounters with any peers can produce perspective-taking opportunities that may advance a child's moral reasoning. A recent research review of cross-cultural studies involving Kohlberg's theory revealed strong support for a link between perspective-taking skills and more advanced moral judgments (Gibbs & others, 2007).

Kohlberg's Critics Kohlberg's theory provoked debate, research, and criticism (Gibbs, 2009; Narvaez & Lapsley, 2009; Walker & Frimer, 2011). Key criticisms involve the link between moral thought and moral behavior, the roles of culture and the family in moral development, and the significance of concern for others.

Moral Thought and Moral Behavior Kohlberg's theory has been criticized for placing too much emphasis on moral thought and not enough emphasis on moral behavior (Walker, 2004). Moral reasons can sometimes be a shelter for immoral behavior. Corrupt CEOs and politicians endorse the loftiest of moral virtues in public before their own behavior is exposed. Whatever the latest public scandal, you will probably find that the culprits displayed virtuous thoughts but engaged in immoral behavior. No one wants a nation of cheaters and thieves who can reason at the postconventional level. The cheaters and thieves may know what is right yet still do what is wrong. Heinous actions can be cloaked in a mantle of moral virtue.

Culture and Moral Reasoning Kohlberg emphasized that his stages of moral reasoning are universal, but some critics claim his theory is culturally biased (Gibbs, 2009; Miller, 2007). Both Kohlberg and his critics may be partially correct. One review of 45 studies in 27 cultures around the world, mostly non-European, provided support for the universality of Kohlberg's first four stages (Snarey, 1987). Individuals in diverse cultures developed through these four stages in sequence as Kohlberg predicted. Stages 5 and 6, however, have not been found in all cultures (Gibbs & others, 2007; Snarey, 1987). Furthermore, Kohlberg's scoring system does not recognize the higher-level moral reasoning of certain cultures and thus that moral reasoning is more culture-specific than Kohlberg envisioned (Snarey, 1987). In sum, although Kohlberg's approach does capture much of the moral reasoning voiced in various cultures around the world, his approach misses or misconstrues some important moral concepts in particular cultures (Gibbs, 2009).



This 14-year-old boy in Nepal is thought to be the sixth holiest Buddhist in the world. In one study of 20 adolescent male Buddhist monks in Nepal, the issue of justice, a basic theme in Kohlberg's theory, was not a central focus in the monks' moral views (Huebner & Garrod, 1993). Also, the monks' concerns about prevention of suffering and the importance of compassion are not captured in Kohlberg's theory.

Families and Moral Development Kohlberg argued that family processes are essentially unimportant in children's moral development. As noted earlier, he argued that parent-child relationships usually provide children with little opportunity for give-and-take or perspective taking. Rather, Kohlberg said that such opportunities are more likely to be provided by children's peer relations.

Did Kohlberg underestimate the contribution of family relationships to moral development? Most experts on children's moral development conclude that parents' moral values and actions influence children's developing moral thoughts (Laible & Thompson, 2007; Walker & Frimer, 2011). Nonetheless, most developmentalists agree with Kohlberg and Piaget that peers play an important role in the development of moral reasoning.

developmental **connection**

Peers. Piaget argued that the mutual give-and-take of peer relations is more important than parenting in enchancing children's moral reasoning. Chapter 8, p. 247

Gender and the Care Perspective The most publicized criticism of Kohlberg's theory has come from Carol Gilligan (1982, 1992, 1996), who argues that Kohlberg's theory reflects a gender bias. According to Gilligan, Kohlberg's theory is based on a male norm that puts abstract principles above relationships and concern for others and sees the individual as standing alone and independently making moral decisions. It puts justice at the heart of morality. In contrast to Kohlberg's **justice perspective,** Gilligan argues for a **care perspective,** which is a moral perspective that views people in terms of their connectedness with others and emphasizes interpersonal communication, relationships with others, and concern for others. According to Gilligan, Kohlberg greatly underplayed the care perspective, perhaps because he was a male, because most of his research was with males rather than females, and because he used male responses as a model for his theory.

However, questions have also been raised about Gilligan's gender conclusions (Walker & Frimer, 2009a, 2011). For example, a meta-analysis (a statistical analysis that combines the results of many different studies) casts doubt on Gilligan's claim of substantial gender differences in moral judgment (Jaffe & Hyde, 2000). And a recent review concluded that girls' moral orientations are "somewhat more likely to focus on care for others than on abstract principles of justice, but they can use both moral orientations when needed (as can boys . . .)" (Blakemore, Berenbaum, & Liben, 2009, p. 132).

Carol Gilligan. *What is Gilligan's view of moral development?*

Social Conventional Reasoning Some theorists and researchers argue that Kohlberg did not adequately distinguish between moral reasoning and social conventional reasoning (Smetana, 2006; Turiel, 2006). **Social conventional reasoning** focuses on conventional rules that have been established by social consensus in order to control behavior and maintain the social system. The rules themselves are arbitrary, such as using a fork at meals and raising your hand in class before speaking.

In contrast, moral reasoning focuses on ethical issues and rules of morality. Unlike conventional rules, moral rules are not arbitrary. They are obligatory, widely accepted, and somewhat impersonal (Turiel, 2006). Rules pertaining to lying, cheating, stealing, and physically harming another person are moral rules because violation of these rules affronts ethical standards that exist apart from social consensus and convention. Moral judgments involve concepts of justice, whereas social conventional judgments are concepts of social organization (Killen, Rutland, & Jampol, 2009; Killen & Smetana, 2010).

Prosocial Behavior

Whereas Kohlberg's and Gilligan's theories have focused primarily on the development of moral reasoning, the study of prosocial moral behavior has placed more emphasis on the behavioral aspects of moral development (Eisenberg & others, 2009). Children engage in both immoral antisocial acts such as lying and cheating and prosocial moral behavior such as showing empathy or acting altruistically (Gasser & Keller, 2009; Heyman & Sweet, 2009). Even during the preschool years, children may care for others or comfort others in distress, but prosocial behavior occurs more often in adolescence than in childhood (Eisenberg & others, 2009).

William Damon (1988) described how sharing develops. During their first years, when children share, it is usually not for reasons of empathy but for the fun of the social play ritual or out of imitation. Then, at about 4 years of age a combination of empathic awareness and adult encouragement produces a sense of obligation on the part of the child to share with others. Most 4-year-olds are not selfless saints, however. Children believe they have an obligation to share but do not necessarily think they should be as generous to others as they are to themselves.

Children's sharing comes to reflect a more complex sense of what is just and right during middle and late childhood. By the start of the elementary school years, children begin to express objective ideas about fairness (Eisenberg, Fabes, & Spinrad, 2006). It is common to hear 6-year-old children use the word *fair* as synonymous

justice perspective A moral perspective that focuses on the rights of the individual; individuals independently make moral decisions.

care perspective The moral perspective of Carol Gilligan, which views people in terms of their connectedness with others and emphasizes interpersonal communication, relationships with others, and concern for others.

social conventional reasoning Thoughts about social consensus and convention, in contrast to moral reasoning, which stresses ethical issues.

with equal or same. By the mid- to late elementary school years, children believe that equity instead sometimes means that people with special merit or special needs deserve special treatment.

Moral Personality Beyond the development of moral reasoning and specific moral feelings and prosocial behaviors, do children also develop a pattern of moral characteristics that is distinctively their own? In other words, do children develop a *moral personality*, and if so, what are its components? Researchers have focused attention on three possible components (Walker & Frimer, 2009b, 2011; Walker, Frimer, & Dunlop, 2010): (1) moral identity, (2) moral character, and (3) moral exemplars:

How does children's sharing change from the preschool to the elementary school years?

- *Moral identity*. Individuals have a moral identity when moral notions and moral commitments are central to their lives. They construct the self with reference to moral categories. Violating their moral commitment would place the integrity of their self at risk.
- *Moral character*. A person with moral character has the willpower, desires, and integrity to stand up to pressure, overcome distractions and disappointments, and behave morally. A person of good moral character displays moral virtues such as "honesty, truthfulness, and trustworthiness, as well as those of care, compassion, thoughtfulness, and considerateness. Other salient traits revolve around virtues of dependability, loyalty, and conscientiousness" (Walker, 2002, p. 74).
- *Moral exemplars*. Moral exemplars are people who have lived exemplary moral lives. Their moral personality, identity, character, and set of virtues reflect moral excellence and commitment (Walker & Frimer, 2008).

In sum, moral development is a multifaceted, complex concept. Included in this complexity are an individual's thoughts, feelings, behaviors, and personality.

GENDER

Gilligan's claim that Kohlberg's theory of moral development reflects gender bias reminds us of the pervasive influence of gender on development. Long before elementary school, boys and girls show preferences for different toys and activities. As we discussed in Chapter 8, preschool children display a gender identity and gender-typed behavior that reflects biological, cognitive, and social influences. Here we will examine gender stereotypes, gender similarities and differences, and gender-role classification.

What are little boys made of?
Frogs and snails
And puppy-dogs' tails.
What are little girls made of?
Sugar and spice
And all that's nice.

—J. O. Halliwell
English Author, 19th Century

Gender Stereotypes According to the old ditty, boys are made of "frogs and snails" and girls are made of "sugar and spice and all that is nice." In the past, a well-adjusted boy was supposed to be independent, aggressive, and powerful. A well-adjusted girl was supposed to be dependent, nurturing, and uninterested in power. These notions reflect **gender stereotypes,** which are broad categories that reflect general impressions and beliefs about females and males.

Recent research has found that gender stereotypes are, to a great extent, still present in today's world, both in the lives of children and adults (Best, 2010; Martin & Ruble, 2010). Gender stereotyping continues to change during middle and late childhood and adolescence (Blakemore, Berenbaum, & Liben, 2009). By the time children enter elementary school, they have considerable knowledge about which activities are linked with being male or female. Until about 7 to 8 years of age, gender stereotyping is extensive because young children don't recognize individual variations in masculinity and femininity. By 5 years of age, both boys and girls stereotype boys as powerful and in more negative terms, such as mean, and girls in

gender stereotypes Broad categories that reflect our impressions and beliefs about females and males.

more positive terms, such as nice (Martin & Ruble, 2010). Across the elementary school years, children become more flexible in their gender attitudes (Trautner & others, 2005).

A recent study of 3- to 10-year-old U.S. children revealed that girls and older children used a higher percentage of gender stereotypes (Miller & others, 2009). In this study, appearance stereotypes were more prevalent on the part of girls while activity (sports, for example) and trait (aggressive, for example) stereotyping was more commonly engaged in by boys. Researchers also have found that boys' gender stereotypes are more rigid than girls' (Blakemore, Berenbaum, & Liben, 2009).

Gender Similarities and Differences What is the reality behind gender stereotypes? Let's examine some of the similarities and differences between the sexes, keeping in mind that (1) the differences are averages—not all females versus all males; (2) even when differences are reported, there is considerable overlap between the sexes; and (3) the differences may be due primarily to biological factors, sociocultural factors, or both. First, we will examine physical similarities and differences, and then we will turn to cognitive and socioemotional similarities and differences.

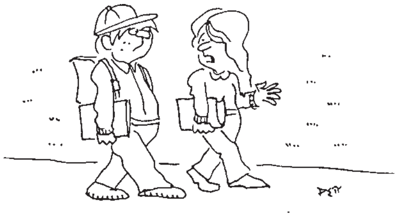
Physical Development Women have about twice the body fat of men, most concentrated around breasts and hips. In males, fat is more likely to go to the abdomen. On the average, males grow to be 10 percent taller than females. Other physical differences are less obvious. From conception on, females have a longer life expectancy than males, and females are less likely than males to develop physical or mental disorders. Males have twice the risk of coronary disease as females.

Does gender matter when it comes to brain structure and function? Human brains are much alike, whether the brain belongs to a male or a female (Halpern & others, 2007). However, researchers have found some differences in the brains of males and females (Hofer & others, 2007). For example, female brains are smaller than male brains, but female brains have more folds; the larger folds (called convolutions) allow more surface brain tissue within the skulls of females than males (Luders & others, 2004). An area of the parietal lobe that functions in visuospatial skills is larger in males than females (Frederikse & others, 2000). And the areas of the brain involved in emotional expression show more metabolic activity in females than males (Gur & others, 1995).

Although some differences in brain structure and function have been found, many of these differences are either small or research is inconsistent regarding the differences. Also, when sex differences in the brain have been revealed, in many cases they have not been directly linked to psychological differences (Blakemore, Berenbaum, & Liben, 2009). Although research on sex differences in the brain is still in its infancy, it is likely that there are far more similarities than differences in the brains of females and males. A further point is worth noting: Anatomical sex differences in the brain may be due to the biological origins of these differences, behavioral experiences (which underscores the brain's continuing plasticity), or a combination of these factors.

Cognitive Development No gender differences in general intelligence have been revealed but some gender differences have been found in some cognitive areas (Blakemore, Berenbaum, & Liben, 2009). Research has shown that in general girls and women have slightly better verbal skills than boys and men, although in some verbal skills areas the differences are substantial (Blakemore, Berenbaum, & Liben, 2009). For example, in recent national assessments, girls were significantly better than boys in reading and writing (National Assessment of Educational Progress, 2005, 2007).

Are there gender differences in math? A recent very large-scale study of more than 7 million U.S. students in grades 2 through 11 revealed no differences in math



"So according to the stereotype, you can put two and two together, but I can read the handwriting on the wall."
© Joel Pett. All rights reserved.

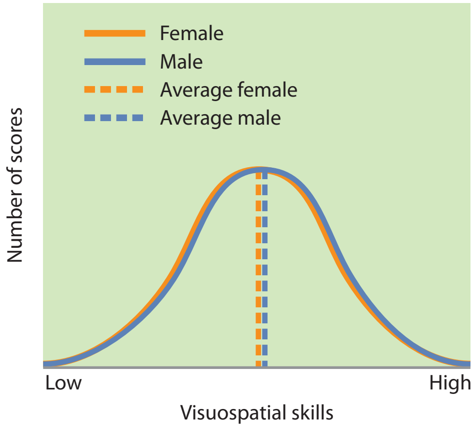


FIGURE 10.3

VISUOSPATIAL SKILLS OF MALES AND FEMALES. Notice that, although an average males' visuospatial skills are higher than an average females' scores for the two sexes almost entirely overlap. Not all males have better visuospatial skills than all females—the overlap indicates that, although the average male score is higher, many females outperform most males on such tasks.

scores for boys and girls (Hyde & others, 2008). One area of math that has been examined for possible gender differences is visuospatial skills, which include being able to rotate objects mentally and determine what they would look like when rotated. These types of skills are important in courses such as plane and solid geometry and geography. A recent research review revealed that boys have better visuospatial skills than girls (Halpern & others, 2007). For example, despite equal participation in the National Geography Bee, in most years all 10 finalists are boys (Liben, 1995). However, some experts argue that the gender difference in visuospatial skills is small (Hyde, 2007) (see Figure 10.3).

Socioemotional Development Three areas of socioemotional development in which gender similarities and differences have been studied extensively are aggression, emotion, and prosocial behavior.

One of the most consistent gender differences is that boys are more physically aggressive than girls are (Baillargeon & others, 2007; Brendgen, 2009). The difference occurs in all cultures and appears very early in children's development (White, 2001). The physical aggression difference is especially pronounced when children are provoked. Both biological and environmental factors have been proposed to account for gender differences in aggression. Biological factors include heredity and hormones. Environmental factors include cultural expectations, adult and peer models, and social agents that reward aggression in boys and punish aggression in girls.

Although boys are consistently more physically aggressive than girls, might girls show as much or more verbal aggression, such as yelling, than boys? When verbal aggression is examined, gender differences often disappear; sometimes, though, verbal aggression is more pronounced in girls (Eagly & Steffen, 1986).

Recently, increased interest has been shown in *relational aggression*, which involves harming someone by manipulating a relationship (Crick & others, 2009; Salmivalli & Peets, 2009). Relational aggression includes such behaviors as trying to make others dislike a certain individual by spreading malicious rumors about the person (Underwood, 2004). Relational aggression increases in middle and late childhood (Dishion & Piehler, 2009). Mixed findings have characterized research on whether girls show more relational aggression than boys, but one consistency in findings is that relational aggression comprises a greater percentage of girls' overall aggression than is the case for boys (Putallaz & others, 2007). And a recent research review revealed that girls engage in more relational aggression than boys in adolescence but not in childhood (Smith, Rose, & Schwartz-Mette, 2010). A recent study found links between parenting and children's relational aggression (Kuppens & others, 2009). In this study, parents' psychological control was linked to a higher incidence of relational aggression in their children.

What gender differences characterize children's prosocial behavior?

What gender differences characterize aggression?

Are there gender differences in emotion? Girls are more likely to express their emotions openly and intensely than are boys, especially in displaying sadness and fear (Blakemore, Berenbaum, & Liben, 2009). Girls also are better at reading others' emotions and more likely to show empathy than are boys (Blakemore, Berenbaum, & Liben, 2009). Males usually show less self-regulation of emotion than females, and this low self-control can translate into behavioral problems (Eisenberg, Spinrad, & Smith, 2004).

Are there gender differences in prosocial behavior? Females view themselves as more prosocial and empathic (Eisenberg & Morris, 2004). Across childhood and adolescence, females engage in more prosocial behavior (Hastings, Utendale, & Sullivan, 2007). The biggest gender difference occurs for kind and considerate behavior with a smaller difference in sharing.

Earlier in the chapter, we discussed Carol Gilligan's theory that many females are more sensitive about relationships and have better relationship skills than males do. In Chapter 14, "Socioemotional Development in Early Adulthood," we will further explore this area of gender.

developmental **connection**

Gender. The nature and extent of gender differences in communication in relationships is controversial. Chapter 14, p. 467

Gender-Role Classification Not long ago, it was accepted that boys should grow up to be masculine and girls to be feminine. In the 1970s, however, as both females and males became dissatisfied with the burdens imposed by their stereotypical roles, alternatives to femininity and masculinity were proposed. Instead of describing masculinity and femininity as a continuum in which more of one means less of the other, it was proposed that individuals could have both masculine and feminine traits.

This thinking led to the development of the concept of **androgyny,** the presence of positive masculine and feminine characteristics in the same person (Bem, 1977; Spence & Helmreich, 1978). The androgynous boy might be assertive (masculine) and nurturant (feminine). The androgynous girl might be powerful (masculine) and sensitive to others' feelings (feminine). Measures have been developed to assess androgyny (see Figure 10.4).

Examples of masculine items

Defends open beliefs
Forceful
Willing to take risks
Dominant
Aggressive

Examples of feminine items

Does not use harsh language
Affectionate
Loves children
Understanding
Gentle

FIGURE **10.4**

THE BEM SEX-ROLE INVENTORY These items are from the Bem Sex-Role Inventory (BSRI). When taking the BSRI, an individual is asked to indicate on a 7-point scale how well each of the 60 characteristics describes herself or himself. The scale ranges from 1 (never or almost never time) to 7 (always or almost always true). The items are scored on independent dimensions of masculinity and femininity. Individuals who score high on the masculine items and low on the feminine items are categorized as masculine; those who score high on the feminine items and low on the masculine items are categorized as feminine; and those who score high on both the masculine and feminine items are categorized as androgynous.

Gender experts, such as Sandra Bem, argue that androgynous individuals are more flexible, competent, and mentally healthy than their masculine or feminine counterparts. To some degree, though, which gender-role classification is best depends on the context involved. For example, in close relationships, feminine and androgynous orientations might be more desirable. One study found that girls and individuals high in femininity showed a stronger interest in caring than did boys and individuals high in masculinity (Karniol, Groz, & Schorr, 2003). However, masculine and androgynous orientations might be more desirable in traditional academic and work settings because of the achievement demands in these contexts.

Despite talk about the "sensitive male," William Pollack (1999) argues that little has been done to change traditional ways of raising boys. He says that the "boy code" tells boys that they should show little if any emotion and should act tough. Boys learn the boy code in many contexts—sandboxes, playgrounds, schoolrooms, camps, hangouts. The result, according to Pollack, is a "national crisis of boyhood." Pollack and others suggest that boys would benefit from being socialized to express their anxieties and concerns and to better regulate their aggression.

Gender in Context Both the concept of androgyny and gender stereotypes talk about people in terms of personality traits such as "aggressive" or "caring." However, which traits people display may vary with the situation (Leaper & Friedman, 2007). Thus, the nature and extent of gender differences may depend on the context (Blakemore, Berenbaum, & Liben, 2009).

Consider helping behavior. The stereotype is that females are better than males at helping. But it depends on the situation. Females are more likely than males to volunteer their time to help children with personal problems and to engage in caregiving behavior. However, in situations in which males feel a sense of competence and that involve danger, males are more likely than females to help (Eagly & Crowley, 1986). For example, a male is more likely than a female to stop and help a person stranded

androgyny The presence of positive masculine and feminine characteristics in the same individual.

In China, females and males are usually socialized to behave, feel, and think differently. The old patriarchal traditions of male supremacy have not been completely uprooted. Chinese women still make considerably less money than Chinese men do, and in rural China (such as here in the Lixian Village of Sichuan) male supremacy still governs many women's lives.

by the roadside with a flat tire. Indeed, one study documented that males are more likely to help when the context is masculine in nature (MacGeorge, 2003).

The importance of considering gender in context is nowhere more apparent than when examining what is culturally prescribed behavior for females and males in different countries around the world (Best, 2010). Although there has been greater acceptance of androgyny and similarities in male and female behavior in the United States, in many countries gender roles have remained gender-specific. For example, in many Middle Eastern countries the division of labor between males and females is dramatic. Males are socialized and schooled to work in the public sphere, females in the private world of home and child rearing. For example, in Iran the dominant view is that the man's duty is to provide for his family and the woman's is to care for her family and household. China also has been a male-dominant culture. Although women have made some strides in China, especially in urban areas, the male role is still dominant. Most males in China do not accept androgynous behavior and gender equity.

developmental **connection**

Community and Culture. Bronfenbrenner's ecological theory emphasizes the importance of contexts; in his theory the macrosystem includes cross-cultural comparisons. Chapter 1, p. 29

Review *Connect* Reflect

LG1 Discuss emotional and personality development in middle and late childhood.

Review

- What changes take place in the self during the middle and late childhood years?
- How does emotion change during middle and late childhood?
- What is Kohlberg's theory of moral development, and how has it been criticized? How does prosocial behavior develop during the middle and late childhood years?
- What are gender stereotypes, and what are some important gender differences?

Connect

- In Chapter 5, you learned about the concept of joint attention. How is that similar to or different from the concept of perspective taking you learned about here?

Reflect *Your Own Personal Journey of Life*

- A young man who had been sentenced to serve 10 years for selling a small amount of marijuana walked away from a prison camp six months after he was sent there. He is now in his fifties and has been a model citizen. Should he be sent back to prison? Why or why not? At which Kohlberg stage should your response be placed? Do you think the stage at which you placed your response accurately captures the level of your moral thinking? Explain.

2 Families

LG2 Describe developmental changes in parent-child relationships, parents as managers, and societal changes in families.

Developmental Changes in Parent-Child Relationships

Parents as Managers

Stepfamilies

Our discussion of parenting and families in this section focuses on how parent-child interactions typically change in middle and late childhood, the importance of parents being effective managers of children's lives, and how children are affected by living with stepparents.

DEVELOPMENTAL CHANGES IN PARENT-CHILD RELATIONSHIPS

As children move into the middle and late childhood years, parents spend considerably less time with them. In one study, parents spent less than half as much time with their children aged 5 to 12 in caregiving, instruction, reading, talking, and playing as when the children were younger (Hill & Stafford, 1980). Although parents spend less time with their children in middle and late childhood than in early childhood, parents continue to be extremely important in their children's lives. In a recent analysis of the contributions of parents in middle and late childhood, the following conclusion was reached: "Parents serve as gatekeepers and provide scaffolding as children assume more responsibility for themselves and . . . regulate their own lives" (Huston & Ripke, 2006, p. 422).

Parents especially play an important role in supporting and stimulating children's academic achievement in middle and late childhood (Gupta, Thornton, & Huston, 2008; Huston & Bentley, 2010; Huston & Ripke, 2006). The value parents place on education can mean the difference in whether children do well in school. Parents not only influence children's in-school achievement, but they also make decisions about children's out-of-school activities. Whether children participate in such activities as sports, music, and other activities is heavily influenced by the extent to which parents sign up children for such activities and encourage their participation (Simpkins & others, 2006).

Elementary school children tend to receive less physical discipline than they did as preschoolers. Instead of spanking or coercive holding, their parents are more likely to use deprivation of privileges, appeals to the child's self-esteem, comments designed to increase the child's sense of guilt, and statements that the child is responsible for his or her actions.

During middle and late childhood, some control is transferred from parent to child. The process is gradual, and it produces coregulation rather than control by either the child or the parent alone. Parents continue to exercise general supervision and control, while children are allowed to engage in moment-to-moment self-regulation. The major shift to autonomy does not occur until about the age of 12 or later. A key developmental task as children move toward autonomy is learning to relate to adults outside the family on a regular basis—adults who interact with the child much differently than parents, such as teachers.

PARENTS AS MANAGERS

Parents can play important roles as managers of children's opportunities, as monitors of their behavior, and as social initiators and arrangers (Parke & Buriel, 2006; Gauvain & Parke, 2010). Mothers are more likely than fathers to engage in a managerial role in parenting.

Researchers have found that family management practices are positively related to students' grades and self-responsibility, and negatively to school-related problems (Eccles, 2007; Taylor & Lopez, 2005). Among the most important family management practices in this regard are maintaining a structured and organized family environment, such as establishing routines for homework, chores, bedtime, and so on, and effectively monitoring the child's behavior. A recent research review of family functioning in African American students' academic achievement found that when African American parents monitored their son's academic achievement by ensuring that homework was completed, restricted time spent on nonproductive distractions (such as video games and TV), and participated in a consistent, positive dialogue with teachers and school officials, their son's academic achievement benefited (Mandara, 2006).

STEPFAMILIES

Not only has divorce become commonplace in the United States, so has getting remarried (Gosselin, 2010; Higginbotham, Skogrand, & Torres, 2010). It takes time for parents to marry, have children, get divorced, and then remarry. Consequently, there are far more elementary and secondary school children than infant or preschool children living in stepfamilies.

developmental **connection**

Family. Approximately 50 percent of remarried women bear children within their newly formed union. Chapter 14, p. 461

The number of remarriages involving children has grown steadily in recent years. Also, divorces occur at a 10 percent higher rate in remarriages than in first marriages (Cherlin & Furstenberg, 1994). About half of all children whose parents divorce will have a stepparent within four years of the separation.

Remarried parents face some unique tasks. The couple must define and strengthen their marriage and at the same time renegotiate the biological parent-child relationships and establish stepparent-stepchild and stepsibling relationships (Coleman, Ganong, & Fine, 2004). The complex histories and multiple relationships make adjustment difficult in a stepfamily (Hetherington & Stanley-Hagan, 2002). Only one-third of stepfamily couples stay remarried.

In some cases, the stepfamily may have been preceded by the death of a spouse. However, by far the largest number of stepfamilies are preceded by divorce rather than death (Pasley & Moorefield, 2004). Three common types of stepfamily structure are (1) stepfather, (2) stepmother, and (3) blended or complex. In stepfather families, the mother typically had custody of the children and remarried, introducing a stepfather into her children's lives. In stepmother families, the father usually had custody and remarried, introducing a stepmother into his children's lives. In a blended or complex stepfamily, both parents bring children from previous marriages to live in the newly formed stepfamily.

In E. Mavis Hetherington's (2006) most recent longitudinal analyses, children and adolescents who had been in a simple stepfamily (stepfather or stepmother) for a number of years were adjusting better than in the early years of the remarried family and were functioning well in comparison to children and adolescents in conflicted nondivorced families and children and adolescents in complex (blended) stepfamilies. More than 75 percent of the adolescents in long-established simple stepfamilies described their relationships with their stepparents as "close" or "very close." Hetherington (2006) concluded that in long-established simple stepfamilies adolescents seem to eventually benefit from the presence of a stepparent and the resources provided by the stepparent.

Children often have better relationships with their custodial parents (mothers in stepfather families, fathers in stepmother families) than with stepparents (Santrock, Sitterle, & Warshak, 1988). Also, children in simple families often show better adjustment than their counterparts in complex

How does living in a stepfamily influence a child's development?

(blended) families (Hetherington & Kelly, 2002). As in divorced families, children in stepfamilies show more adjustment problems than children in nondivorced families (Hetherington & Kelly, 2002). The adjustment problems are similar to those found among children of divorced parents—academic problems and lower self-esteem, for example (Anderson & others, 1999). However, it is important to recognize that a majority of children in stepfamilies do not have problems. In one analysis, 25 percent of children from stepfamilies showed adjustment problems compared to 10 percent in intact, never-divorced families (Hetherington & Kelly, 2002).

Adolescence is an especially difficult time for the formation of a stepfamily (Gosselin, 2010). This may occur because becoming part of a stepfamily exacerbates normal adolescent concerns about identity, sexuality, and autonomy.

Review *Connect* Reflect

LG2 Describe developmental changes in parent-child relationships, parents as managers, and societal changes in families.

Review

- What changes characterize parent-child relationships in middle and late childhood?
- How can parents be effective managers of children's lives?
- How does being in a stepfamily influence children's development?

Connect

- In this section you learned about the effects of being part of a stepfamily on the development of children. What did you learn in Chapter 8 about children in divorced families, parenting style, and children's adjustment?

Review *Your Own Personal Journey of Life*

- What was your relationship with your parents like when you were in elementary school? How do you think it influenced your development?

3 Peers

LG3 Identify changes in peer relationships in middle and late childhood.

- Developmental Changes
- Peer Status
- Social Cognition
- Bullying
- Friends

Having positive relationships with peers is especially important in middle and late childhood (Asher & McDonald, 2009; Bukowski, Motzoi, & Meyer, 2009). Engaging in positive interactions with peers, resolving conflicts with peers in nonaggressive ways, and having quality friendships in middle and late childhood not only have positive outcomes at this time in children's lives, but also are linked to more positive relationship outcomes in adolescence and adulthood (Huston & Ripke, 2006). For example, in one longitudinal study being popular with peers and engaging in low levels of aggression at 8 years of age were related to higher levels of occupational status at 48 years of age (Huesmann & others, 2006). Another study found that peer competence (a composite measure that included social contact with peers, popularity with peers, friendship, and social skills) in middle and late childhood was linked to having better relationships with coworkers in early adulthood (Collins & van Dulmen, 2006).

DEVELOPMENTAL CHANGES

As children enter the elementary school years, reciprocity becomes especially important in peer interchanges. Researchers estimate that the percentage of time spent in social interaction with peers increases from approximately 10 percent at 2 years of age to more than 30 percent in middle and late childhood (Rubin, Bukowski, &

Parker, 2006). In an early classic study, a typical day in elementary school included approximately 300 episodes with peers (Barker & Wright, 1951). As children move through middle and late childhood, the size of their peer group increases, and peer interaction is less closely supervised by adults (Rubin, Bukowski, & Parker, 2006). Until about 12 years of age, children's preference for same-sex peer groups increases.

What are some statuses that children have with their peers?

PEER STATUS

Which children are likely to be popular with their peers and which ones are disliked? Developmentalists address this and similar questions by examining *sociometric status,* a term that describes the extent to which children are liked or disliked by their peer group (Cillessen, 2009). Sociometric status is typically assessed by asking children to rate how much they like or dislike each of their classmates. Or it may be assessed by asking children to nominate the children they like the most and those they like the least.

Developmentalists have distinguished five peer statuses (Wentzel & Asher, 1995):

- **Popular children** are frequently nominated as a best friend and are rarely disliked by their peers.
- **Average children** receive an average number of both positive and negative nominations from their peers.
- **Neglected children** are infrequently nominated as a best friend but are not disliked by their peers.
- **Rejected children** are infrequently nominated as someone's best friend and are actively disliked by their peers.
- **Controversial children** are frequently nominated both as someone's best friend and as being disliked.

Popular children have a number of social skills that contribute to their being well liked. They give out reinforcements, listen carefully, maintain open lines of communication with peers, are happy, control their negative emotions, act like themselves, show enthusiasm and concern for others, and are self-confident without being conceited (Hartup, 1983; Rubin, Bukowski, & Parker, 1998).

Rejected children often have serious adjustment problems (Dishion & Piehler, 2009; Prinstein & others, 2009). One study evaluated 112 fifth-grade boys over a period of seven years until the end of high school (Kupersmidt & Coie, 1990). The best predictor of whether rejected children would engage in delinquent behavior or drop out of school later during adolescence was aggression toward peers in elementary school. A recent study revealed that over the course of elementary school children were less likely to engage in classroom participation during periods of peer rejection, but during times when they were not rejected, they participated more in class (Ladd, Herald-Brown, & Reiser, 2008).

John Coie (2004, pp. 252–253) provided three reasons why aggressive peer-rejected boys have problems in social relationships:

- "First, the rejected, aggressive boys are more impulsive and have problems sustaining attention. As a result, they are more likely to be disruptive of ongoing activities in the classroom and in focused group play.
- Second, rejected, aggressive boys are more emotionally reactive. They are aroused to anger more easily and probably have more difficulty calming down once aroused. Because of this they are more prone to become angry at peers and attack them verbally and physically. . . .
- Third, rejected children have fewer social skills in making friends and maintaining positive relationships with peers."

popular children Children who are frequently nominated as a best friend and are rarely disliked by their peers.

average children Children who receive an average number of both positive and negative nominations from peers.

neglected children Children who are infrequently nominated as a best friend but are not disliked by their peers.

rejected children Children who are infrequently nominated as a best friend and are actively disliked by their peers.

controversial children Children who are frequently nominated both as a best friend and as being disliked.

Not all rejected children are aggressive (Rubin, Cheah, & Menzer, 2010). Although aggression and its related characteristics of impulsiveness and disruptiveness underlie rejection about half the time, approximately 10 to 20 percent of rejected children are shy.

How can rejected children be trained to interact more effectively with their peers? Rejected children may be taught to more accurately assess whether the intentions of their peers are negative (Bierman & Powers, 2009). They may be asked to engage in role playing or to discuss hypothetical situations involving negative encounters with peers, such as when a peer cuts into a line ahead of them. In some programs, children are shown videotapes of appropriate peer interaction and asked to draw lessons from what they have seen (Ladd, Buhs, & Troop, 2004).

SOCIAL COGNITION

A boy accidentally trips and knocks another boy's soft drink out of his hand. That boy misinterprets the encounter as hostile, which leads him to retaliate aggressively against the boy who tripped. Through repeated encounters of this kind, the aggressive boy's classmates come to perceive him as habitually acting in inappropriate ways.

This encounter demonstrates the importance of *social cognition*—thoughts about social matters, such as the aggressive boy's interpretation of an encounter as hostile and his classmates' perception of his behavior as inappropriate (Prinstein & others, 2009). Children's social cognition about their peers becomes increasingly important for understanding peer relationships in middle and late childhood. Of special interest are the ways in which children process information about peer relations and their social knowledge (Dodge, Coie, & Lynam, 2006; Hartup, 2009).

Kenneth Dodge (1983) argues that children go through five steps in processing information about their social world. They decode social cues, interpret, search for a response, select an optimal response, and enact. Dodge has found that aggressive boys are more likely to perceive another child's actions as hostile when the child's intention is ambiguous. And when aggressive boys search for cues to determine a peer's intention, they respond more rapidly, less efficiently, and less reflectively than do nonaggressive children. These are among the social cognitive factors believed to be involved in children's conflicts.

Social knowledge also is involved in children's ability to get along with peers. They need to know what goals to pursue in poorly defined or ambiguous situations, how to initiate and maintain a social bond, and what scripts to follow to get other children to be their friends. For example, as part of the script for getting friends, it helps to know that saying nice things, regardless of what the peer does or says, will make the peer like the child more.

BULLYING

Significant numbers of students are victimized by bullies (Vernberg & Biggs, 2010). In a national survey of more than 15,000 6th- through 10th-grade students, nearly one of every three students said that they had experienced occasional or frequent involvement as a victim or perpetrator in bullying (Nansel & others, 2001). In this study, bullying was defined as verbal or physical behavior intended to disturb someone less powerful. As shown in Figure 10.5, being belittled about looks or speech was the most frequent type of bullying. A recent study revealed that bullying decreased as students went from the fall of the sixth grade (20 percent were bullied extensively) through the spring of the eighth grade (6 percent were bullied extensively) (Nylund & others, 2007). Boys are more likely to be bullies than girls, but gender differences regarding victims of boys is less clear (Salmivalli & Peets, 2009).

Who is likely to be bullied? In the study just described, boys and younger middle school students were most likely to be affected (Nansel & others, 2001).

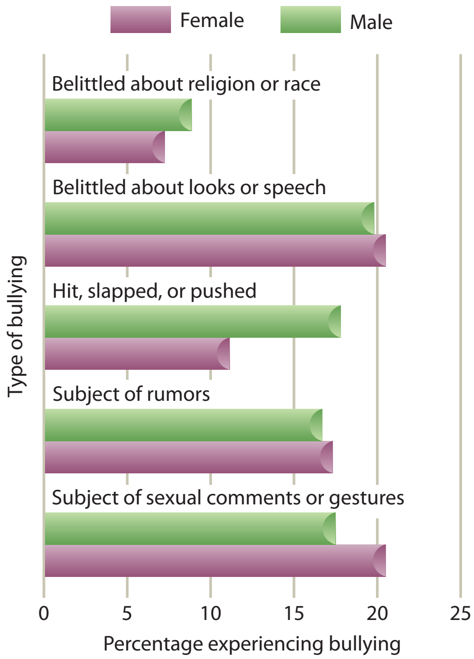


FIGURE **10.5**

BULLYING BEHAVIORS AMONG U.S. YOUTH. This graph shows the type of bullying most often experienced by U.S. youth. The percentages reflect the extent to which bullied students said that they had experienced a particular type of bullying. In terms of gender, note that when they were bullied, boys were more likely to be hit, slapped, or pushed than girls were.

Who is likely to be bullied? What are some outcomes of bullying?

Children who said they were bullied reported more loneliness and difficulty in making friends, while those who did the bullying were more likely to have low grades and to smoke and drink alcohol. Researchers have found that anxious, socially withdrawn, and aggressive children are often the victims of bullying (Hanish & Guerra, 2004). Anxious and socially withdrawn children may be victimized because they are nonthreatening and unlikely to retaliate if bullied, whereas aggressive children may be the targets of bullying because their behavior is irritating to bullies (Rubin, Bukowski, & Parker, 2006).

Social contexts also influence bullying (Schwartz & others, 2010). Recent research indicates that 70 to 80 percent of victims and their bullies are in the same school classroom (Salmivalli & Peets, 2009). Classmates are often aware of bullying incidents and in many cases witness bullying. The larger social context of the peer group plays an important role in bullying (Salmivalli & Peets, 2009). In many cases, bullies torment victims to gain higher status in the peer group and bullies need others to witness their power displays. Many bullies are not rejected by their peer group. In one study, bullies were only rejected by peers for whom they were a potential threat (Veenstra & others, 2010). In another study, bullies often affiliated with each other or in some cases maintained their position in the popular peer group (Wivliet & others, 2010).

What are the outcomes of bullying? A recent study indicated that bullies and their victims in adolescence were more likely to experience depression and engage in suicide ideation and attempt suicide than their counterparts who were not involved in bullying (Brunstein Klomek & others, 2007). Bullying has been linked to suicide: In one recent case, an 8-year-old jumped out of a two-story building in Houston; in another case, a 13-year-old hanged himself in Houston; and in yet another case in Massachusetts, teenagers harassed a girl so mercilessly that she killed herself (Meyers, 2010). Another study revealed that bullies, victims, or those who were both bullies and victims had more health problems (such as headaches, dizziness, sleep problems, and anxiety) than their counterparts who were not involved in bullying (Srabstein & others, 2006). And a recent meta-analysis of 33 studies revealed that peer victimization had a small but significant link with lower academic achievement (Nakamoto & Schwartz, 2010).

What kind of perspective taking and moral motivation skills do bullies, bully-victims, and prosocial children tend to exhibit? To find out, see the *Connecting Through Research* interlude.

Extensive interest is developing in preventing and treating bullying and victimization (Biggs & Vernberg, 2010; Guerra & Williams, 2010; Singh, Orpinas, & Horne, 2010). A recent research review revealed mixed results for school-based intervention (Vreeman & Carroll, 2007). School-based interventions vary greatly, ranging from involving the whole school in an antibullying campaign to individualized social skills training. One of the most promising bullying intervention programs has been created by Dan Olweus. This program focuses on 6- to 15-year-olds with the goal of decreasing opportunities and rewards for bullying. School staff are instructed in ways to improve peer relations and make schools safer. When properly implemented, the program reduces bullying by 30 to 70 percent (Ericson, 2001; Olweus, 2003). Information on how to implement the program can be obtained from the Center for the Prevention of Violence at the University of Colorado: www.colorado.edu/espv/blueprints.

FRIENDS

Like adult friendships, children's friendships are typically characterized by similarity (Giordano, 2009). Throughout childhood, friends are more similar than dissimilar

connecting through research

What Are the Perspective-Taking and Moral Motivation Skill Levels of Bullies, Bully-Victims, Victims, and Prosocial Children?

A recent study explored the roles that perspective taking and moral motivation play in the lives of bullies, bully-victims, victims, and prosocial children (Gasser & Keller, 2009):

- *Bullies* are highly aggressive toward other children but are not victims of bullying.
- *Bully-victims* are not only highly aggressive toward other children but also are the recipients of other children's bullying.
- *Victims* are passive, nonaggressive respondents to bullying.
- *Prosocial children* engage in such positive behaviors as sharing, helping, comforting, and empathizing.

Teacher and peer ratings in 34 classrooms were used to classify 212 7- to 8-year-old boys and girls into the aforementioned four categories. On a 5-point scale (from never to several times a week), teachers rated (1) how often the child bullied others and (2) how often the child was bullied. The ratings focused on three types of bullying and being victimized: physically, verbally, and excluding others. On a 4-point scale (from not applicable to very clearly applicable), teachers also rated children's prosocial behavior on three items: "willingly shares with others," "comforts others if necessary," and "empathizes with others." Peer ratings assessed children's nominations of which children in the classroom acted as bullies, were victimized by bullies, and engaged in prosocial behavior. Combining the teacher and peer ratings after eliminating those that did not agree on which children were bullies, victims, or prosocial children, the final sample consisted of 49 bullies, 80 bully-victims, 33 victims, and 50 prosocial children.

Children's perspective-taking skills were assessed using theory of mind tasks and moral motivation was examined by interviewing children about aspects of right and wrong in stories about children's transgressions. In one theory of mind task, children were tested to see if they understood that people may have false beliefs about another individual. In another theory of mind task, children were assessed to determine if they understood that people sometimes hide their emotions by showing a different emotion than they really feel. A moral interview also was conducted in which children were told four moral transgression stories (with content about being unwilling to share with a classmate, stealing sweets from a classmate, hiding a victim's shoes, and verbally bullying a victim) and then asked to judge whether the acts were right or wrong and how the participants in the stories likely felt.

The results of the study indicated that only bully-victims—but not bullies—were deficient in perspective taking. Further analysis revealed that both aggressive groups of children—bullies and bully-victims—had a deficiency in moral motivation. The analyses were consistent with a portrait of bullies as socially competent and knowledgeable in terms of perspective-taking skills and being able to effectively interact with peers. However, bullies use this social knowledge for their own manipulative purposes. The analysis also confirmed the picture of the bully as being morally insensitive.

in terms of age, sex, race, and many other factors. Friends often have similar attitudes toward school, similar educational aspirations, and closely aligned achievement orientations.

Why are children's friendships important? Willard Hartup (1983, 1996, 2009) has studied peer relations and friendship for more than three decades. He recently concluded that friends can be cognitive and emotional resources from childhood through old age. Friends can foster self-esteem and a sense of well-being.

More specifically, children's friendships can serve six functions (Gottman & Parker, 1987):

- *Companionship*. Friendship provides children with a familiar partner and playmate, someone who is willing to spend time with them and join in collaborative activities.
- *Stimulation*. Friendship provides children with interesting information, excitement, and amusement.
- *Physical support*. Friendship provides time, resources, and assistance.
- *Ego support*. Friendship provides the expectation of support, encouragement, and feedback, which helps children maintain an impression of themselves as competent, attractive, and worthwhile individuals.

developmental **connection**

Peers. Beginning in early adolescence, teenagers typically prefer to have a smaller number of friendships that are more intense and intimate. Chapter 12, p. 391

What are some characteristics of children's friendships?

- *Social comparison*. Friendship provides information about where the child stands vis-à-vis others and whether the child is doing okay.
- *Affection and intimacy*. Friendship provides children with a warm, close, trusting relationship with another individual. **Intimacy in friendships** is characterized by self-disclosure and the sharing of private thoughts. Research reveals that intimate friendships may not appear until early adolescence (Berndt & Perry, 1990).

Although having friends can be a developmental advantage, not all friendships are alike (Vitaro, Boivin, & Bukowski, 2009). People differ in the company they keep—that is, who their friends are. Developmental advantages occur when children have friends who are socially skilled and supportive. However, it is not developmentally advantageous to have coercive and conflict-ridden friendships (Laursen & Pursell, 2009).

The importance of friendship was underscored in a two-year longitudinal study (Wentzel, Barry, & Caldwell, 2004). Sixth-grade students who did not have a friend engaged in less prosocial behavior (cooperation, sharing, helping others), had lower grades, and were more emotionally distressed (depression, low well-being) than their counterparts who had one or more friends. Two years later, in the eighth grade, the students who did not have a friend in the sixth grade were still more emotionally distressed.

Review *Connect* Reflect

LG3 Identify changes in peer relationships in middle and late childhood.

Review

- What developmental changes characterize peer relations in middle and late childhood?
- How does children's peer status influence their development?
- How is social cognition involved in children's peer relations?
- What is the nature of bullying?
- What are children's friendships like?

Connect

- Earlier in the chapter, you read that most developmentalists agree that peers play an important role in the development of moral reasoning. Of the five peer status groups you learned about in this section of the chapter, in which group do you think children would have the least opportunity to fully develop their moral reasoning capacities and why?

Reflect *Your Own Personal Journey of Life*

- Which of the five peer statuses characterized you as a child? Did your peer status change in adolescence? How do you think your peer status as a child has influenced your development?

4 Schools

LG4 Characterize aspects of schooling in children's development in middle and late childhood.

Contemporary Approaches to Student Learning

Socioeconomic Status Ethnicity, and Culture

intimacy in friendships Self-disclosure and the sharing of private thoughts.

For most children, entering the first grade signals new obligations. They develop new relationships and develop new standards by which to judge themselves. School provides children with a rich source of new ideas to shape their sense of self. They will spend many years in schools as members of small societies in which there are tasks to be accomplished, people to be socialized and socialized by, and rules that define and limit behavior, feelings, and attitudes. By the time students graduate from high school, they have spent 12,000 hours in the classroom.

CONTEMPORARY APPROACHES TO STUDENT LEARNING

Controversy swirls about the best way to teach children and how to hold schools and teachers accountable for whether children are learning (Johnson & others, 2011; Parkay & Stanford, 2010).

Is this classroom more likely constructivist or direct instruction? Explain.

Constructivist and Direct Instruction Approaches The **constructivist approach** to instruction is a learner-centered approach that emphasizes the importance of individuals actively constructing their knowledge and understanding with guidance from the teacher. In the constructivist view, teachers should not attempt to simply pour information into children's minds. Rather, children should be encouraged to explore their world, discover knowledge, reflect, and think critically with careful monitoring and meaningful guidance from the teacher (Abruscato & DeRosa, 2010; Eby, Herrell, & Jordan, 2011; Maxim, 2010). The constructivist belief is that for too long in American education children have been required to sit still, be passive learners, and rotely memorize irrelevant as well as relevant information.

Today, constructivism may include an emphasis on collaboration—children working with each other in their efforts to know and understand (Holzman, 2009). A teacher with a constructivist instructional philosophy would not have children memorize information rotely but would give them opportunities to meaningfully construct the knowledge and understand the material while guiding their learning (Maxim, 2010).

By contrast, the **direct instruction approach** is a structured, teacher-centered approach that is characterized by teacher direction and control, high teacher expectations for students' progress, maximum time spent by students on academic tasks, and efforts by the teacher to keep negative affect to a minimum. An important goal in the direct instruction approach is maximizing student learning time.

Advocates of the constructivist approach argue that the direct instruction approach turns children into passive learners and does not adequately challenge them to think in critical and creative ways (Abruscato & DeRosa, 2010; Eby, Herrell, & Jordan, 2011). The direct instruction enthusiasts say that the constructivist approaches do not give enough attention to the content of a discipline, such as history or science. They also believe that the constructivist approaches are too relativistic and vague.

Some experts in educational psychology believe that many effective teachers use both a constructivist *and* a direct instruction approach rather than either exclusively (Bransford & others, 2006). Further, some circumstances may call more for a constructivist approach, others for a direction instruction approach. For example, experts increasingly recommend an explicit, intellectually engaging direct instruction approach when teaching students with a reading or a writing disability (Berninger, 2006).

Accountability Since the 1990s, the U.S. public and governments at every level have demanded increased accountability from schools. One result was the spread of state-mandated tests to measure just what students had or had not learned (Popham, 2011; Yell & Drasgow, 2009). Many states identified objectives for students in their state and created tests to measure whether students were meeting those objectives. This approach became national policy in 2002 when the No Child Left Behind (NCLB) legislation was signed into law.

constructivist approach A learner-centered approach that emphasizes the importance of individuals actively constructing their knowledge and understanding with guidance from the teacher.

direct instruction approach A structured, teacher-centered approach that is characterized by teacher direction and control, mastery of academic skills, high expectations for students' progress, maximum time spent on learning tasks, and efforts to keep negative effect to a minimum.

What are some issues involved in the No Child Left Behind legislation?

Advocates argue that statewide standardized testing will have a number of positive effects. These include improved student performance; more time teaching the subjects that are tested; high expectations for all students; identification of poorly performing schools, teachers, and administrators; and improved confidence in schools as test scores rise.

Critics argue that the NCLB legislation is doing more harm than good (Noddings, 2007; Sadker, Sadker, & Zittleman, 2008). One criticism stresses that using a single test as the sole indicator of students' progress and competence presents a very narrow view of students' skills (Lewis, 2007). This criticism is similar to the one leveled at IQ tests, which we described in Chapter 9. To assess student progress and achievement, many psychologists and educators emphasize that a number of measures should be used, including tests, quizzes, projects, portfolios, classroom observations, and so on. Also, the tests used as part of NCLB don't measure creativity, motivation, persistence, flexible thinking, and social skills (Stiggins, 2008). Critics point out that teachers end up spending far too much class time "teaching to the test" by drilling students and having them memorize isolated facts at the expense of teaching that focuses on thinking skills, which students need for success in life (Pressley, 2007). Also, recall from Chapter 9 that some individuals are concerned that in the era of No Child Left Behind policy there is a neglect of students who are gifted in the effort to raise the achievement level of students who are not doing well (Clark, 2008).

Consider also the following: Each state is allowed to have different criteria for what constitutes passing or failing grades on tests designated for NCLB inclusion. An analysis of NCLB data indicated that almost every fourth-grade student in Mississippi knows how to read but only half of Massachusetts' students do (Birman & others, 2007). Clearly, Mississippi's standards for passing the reading test are far below those of Massachusetts. In the recent analysis of state-by-state comparisons, many states have taken the safe route and kept the standard for passing low. Thus, while one of NCLB's goals was to raise standards for achievement in U.S. schools, apparently allowing states to set their own standards likely has lowered achievement standards.

Despite such criticisms, the U.S. Department of Education is committed to implementing No Child Left Behind, and schools are making accommodations to meet the requirement of this law. Indeed, most educators support the importance of high expectations and high standards of excellence for students and teachers. At issue, however, is whether the tests and procedures mandated by NCLB are the best ones for achieving these high standards (Nitko & Brookhart, 2011; Popham, 2011).

SOCIOECONOMIC STATUS, ETHNICITY, AND CULTURE

Children from low-income, ethnic minority backgrounds have more difficulties in school than do their middle-socioeconomic-status, White counterparts. Why? Critics argue that schools have not done a good job of educating low-income, ethnic minority students to overcome the barriers to their achievement (Entwisle, Alexander, & Olson, 2010; Tamis-LeMonda & McFadden, 2010). And recent comparisons of student achievement indicate that U.S. students have lower achievement in math and science than a number of countries, especially those in east Asia (TIMMS, 2008). Let's further explore the roles of socioeconomic status, ethnicity, and culture in schools.

The Education of Students from Low-Income Backgrounds Many children in poverty face problems that present barriers to their learning (Huston & Bentley, 2010; Rowley, Kurtz-Costes, & Cooper, 2011). They might have parents who don't set high educational standards for them, who are incapable of reading to them, or who don't have enough money to pay for educational materials and experiences, such as books and trips to zoos and museums. They might be malnourished or live in areas where crime and violence are a way of life. A recent study revealed that neighborhood disadvantage (involving such characteristics as low neighborhood income and high unemployment) was linked to less consistent, less stimulating, and more punitive parenting, and ultimately to negative child outcomes such as behavioral problems and low verbal ability (Kohen & others, 2008). Another recent study revealed that the longer children experienced poverty the more detrimental the poverty was to their cognitive development (Najman & others, 2009).

Compared with schools in higher income areas, schools in low-income areas are more likely to have more students with low achievement test scores, low graduation rates, and small percentages of students going to college; they are more likely to have young teachers with less experience; and they are more likely to encourage rote learning (Koppelman & Goodhart, 2011; Spring, 2010). Too few schools in low-income neighborhoods provide students with environments that are conducive to learning (Nelson & Lee, 2009; Tamis-LeMonda & McFadden, 2010). Many of the schools' buildings and classrooms are old and crumbling. These are the types of undesirable conditions Jonathan Kozol (2005) observed in many inner-city schools, including the South Bronx in New York City, as described at the beginning of the chapter. In sum, far too many schools in low-income neighborhoods provide students with environments that are not conducive to effective learning (Huston & Bentley, 2010; Rowley, Kurtz-Costes, & Cooper, 2010).

Jill Nakamura, teaching in her first-grade classroom. Jill teaches at a school located in a high-poverty area. She visits students at home early in the school year in an effort to connect with them and develop a partnership with their parents. "She holds a daily after school club for students reading below grade level . . . ; those who don't want to attend must call parents to tell them. In one school year (2004), she "raised the percent of students reading at or above grade level from 29 percent to 76 percent" (Wong Briggs, 2004, p. 6D).

Might intervention with families of children living in poverty improve children's school performance? In a recent experimental study, Aletha Huston and her colleagues (2006; Gupta, Thornton, & Huston, 2008) evaluated the effects of New Hope—a program designed to increase parental employment and reduce family poverty—on adolescent development. They randomly assigned families with 6- to 10-year-old children living in poverty to the New Hope program and a control group. New Hope offered adults living in poverty who were employed 30 or more hours a week benefits that were designed to increase family income (a wage supplement which ensured that net income increased as parents earned more) and provided work supports through subsidized child care (for any child under age 13) and health insurance. Management services were provided to New Hope participants to assist them in job searches and other needs. The New Hope program was available to the experimental group families for three years (until the children were 9 to 13 years old). Five years after the program began and two years after it had ended, the program's effects on the children were examined when they were 11 to 16 years old. Compared with adolescents in the control group, New Hope adolescents were more competent at reading, had better school performance, were less likely to be in special education classes, had more positive social skills, and were more likely to be in formal after-school arrangements. New Hope parents reported better psychological well-being and a greater sense of self-efficacy in managing their adolescents than control parents did.

Ethnicity in Schools More than one-third of all African American and almost one-third of all Latino students attend schools in the 47 largest city school districts in the United States, compared with only 5 percent of all White and 22 percent of all Asian American students. Many of these inner-city schools are still segregated, are grossly underfunded, and do not provide adequate opportunities for children to learn effectively. Thus, the effects of SES and the effects of ethnicity are often intertwined (Banks, 2010; Bennett, 2011).

Even outside of inner-city schools, school segregation remains a factor in U.S. education (Koppelman, 2011). Almost one-third of all African American and Latino students attend schools in which 90 percent or more of the students are from minority groups (Banks, 2010).

The school experiences of students from different ethnic groups vary considerably (Taylor & Whittaker, 2009). African American and Latino students are much less likely than non-Latino White or Asian American students to be enrolled in academic, college preparatory programs and are much more likely to be enrolled in remedial and special education programs. Asian American students are far more likely than other ethnic minority groups to take advanced math and science courses in high school. African American students are twice as likely as Latinos, Native Americans, or Whites to be suspended from school.

Following are some strategies for improving relationships among ethnically diverse students:

- *Turn the class into a jigsaw classroom*. When Eliot Aronson was a professor at the University of Texas at Austin, the school system contacted him for ideas on how to reduce the increasing racial tension in classrooms. Aronson (1986) developed the concept of "jigsaw classroom," in which students from different cultural backgrounds are placed in a cooperative group in which they have to construct different parts of a project to reach a common goal. Aronson used the term jigsaw because he saw the technique as much like a group of students cooperating to put different pieces together to complete a jigsaw puzzle. How might this work? Team sports, drama productions, and music performances are examples of contexts in which students participate cooperatively to reach a common goal; however, the jigsaw technique also lends itself to group science projects, history reports, and other learning experiences with a variety of subject matter.
- *Encourage students to have positive personal contact with diverse other students.* Mere contact does not do the job of improving relationships with diverse others. For example, busing ethnic minority students to predominantly White schools, or vice versa, has not reduced prejudice or improved interethnic relations. What matters is what happens after children get to school. Especially beneficial in improving interethnic relations is sharing one's worries, successes, failures, coping strategies, interests, and other personal information with people of other ethnicities. When this happens, people tend to look at others as individuals rather than as members of a homogeneous group.
- *Reduce bias*. Teachers can reduce bias by displaying images of children from diverse ethnic and cultural groups, selecting play materials and classroom activities that encourage cultural understanding, helping students resist stereotyping, and working with parents to reduce children's exposure to bias and prejudice at home.
- *View the school and community as a team*. James Comer (1988, 2004, 2006, 2010) advocates a community, team approach as the best way to educate children. Three important aspects of the Comer Project for Change are (1) a governance and management team that develops a comprehensive school plan, assessment strategy, and staff development plan; (2) a mental health or school support team; and (3) a parent's program. Comer believes that the entire school community should have a cooperative rather than an adversarial attitude. The Comer program is currently operating in more than 600 schools in 26 states. Read further about James Comer's work in *Connecting With Careers*.
- *Be a competent cultural mediator*. Teachers can play a powerful role as cultural mediators by being sensitive to biased content in materials and classroom interactions, learning more about different ethnic groups, being sensitive to children's ethnic attitudes, viewing students of color positively, and thinking of positive ways to get parents of color more involved as partners with teachers in educating children (Manning & Baruth, 2009; Taylor & Whittaker, 2009).

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In *The Shame of a Nation*, Jonathan Kozol (2005) criticized the inadequate quality and lack of resources in many U.S. schools, especially those in the poverty areas of inner cities, that have high concentrations of ethnic minority children. Kozol praises teachers like Angela Lively (*above*), who keeps a box of shoes in her Indianapolis classroom for students in need.

connecting with careers

James Comer, Child Psychiatrist

James Comer grew up in a low-income neighborhood in East Chicago, Indiana, and credits his parents with leaving him with no doubt about the importance of education. He earned a B.A. degree from Indiana University, and went on to obtain a medical degree from Howard University College of Medicine, a Master of Public Health degree from the University of Michigan School of Public Health, and psychiatry training at the Yale University School of Medicine's Child Study Center. He currently is the Maurice Falk professor of Child Psychiatry at the Yale University Child Study Center and an associate dean at the Yale University Medical School. During his years at Yale, Comer has concentrated on promoting a focus on child development as a way of improving schools. His efforts in support of healthy development of young people are known internationally.

Comer is, perhaps, best known for the founding of the School Development Program in 1968, which promotes the collaboration of parents, educators, and community to improve social, emotional, and academic outcomes for children.

James Comer (*left*) is shown with some of the inner-city children who attend a school that became a better learning environment because of Comer's intervention.

For more information about what child psychiatrists do, see page 46 in the Careers in Life-Span Development appendix.

Cross-Cultural Comparisons In the past three decades, the poor performance of American children in math and science has become well publicized (Educational Testing Service, 1992). In a recent large-scale comparison of math and science achievement in 4th grade students in 2007, the average U.S. 4th grade math score was higher than 23 of the 35 countries and lower than 8 countries (all in Asia and Europe) (National Center for Education Statistics, 2009). Fourth graders from Hong Kong had the highest math score. The average 4th grade U.S. math score did improve slightly (11 points) from the same assessment in 1995, but some Asian countries improved their scores considerably more—the Hong Kong score was 50 points higher and the Slovenia score 40 points higher in 2007 than in 1995, for example.

In 2007, the 4th-grade U.S. science score was higher than those in 25 countries and lower than those in 4 countries (all in Asia). However, the average U.S. 4th-grade science score decreased 3 points from 1995 to 2007 while the science scores for some countries increased dramatically—63 points in Singapore, 56 points in Latvia, and 55 points in Iran, for example.

Harold Stevenson's (1995, 2000; Stevenson, Hofer, & Randel, 1999; Stevenson & others, 1990) research explores reasons for the poor performance of American students compared to students in selected Asian countries. Stevenson and his colleagues have completed five cross-cultural comparisons of students in the United States, China, Taiwan, and Japan. In these studies, Asian students consistently outperform American students. And the longer the students are in school, the wider the gap

How do U.S. students fare against Asian students in math and science achievement? What were some findings in Stevenson's research that might explain the results of those international comparisons?

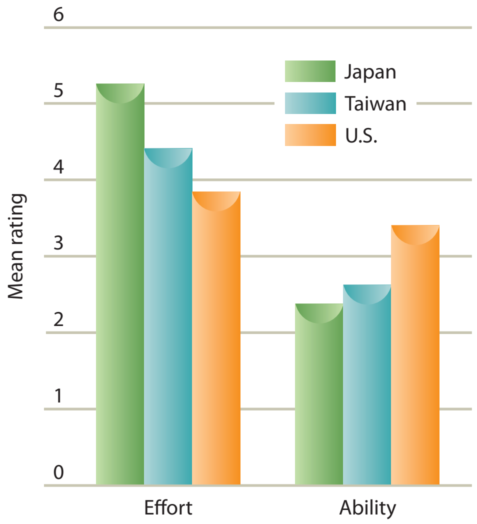

FIGURE **10.6**

MOTHERS' BELIEFS ABOUT THE FACTORS RESPONSIBLE FOR CHILDREN'S MATH ACHIEVEMENT IN THREE COUNTRIES. In one study, mothers in Japan and Taiwan were more likely to believe that their children's math achievement was due to effort rather than innate ability, while U.S. mothers were more likely to believe their children's math achievement was due to innate ability (Stevenson, Lee, & Stigler, 1986). If parents believe that their children's math achievement is due to innate ability and their children are not doing well in math, the implication is that they are less likely to think their children will benefit from putting forth more effort.

becomes between Asian and American students—the lowest difference is in the 1st grade, the highest in the 11th grade (the highest grade studied).

To learn more about the reasons for these large cross-cultural differences, Stevenson and his colleagues spent thousands of hours observing in classrooms, as well as interviewing and surveying teachers, students, and parents. They found that the Asian teachers spent more of their time teaching math than did the American teachers. For example, more than one-fourth of total classroom time in the first grade was spent on math instruction in Japan, compared with only one-tenth of the time in the U.S. 1st-grade classrooms. Also, the Asian students were in school an average of 240 days a year, compared with 178 days in the United States.

In addition to the substantially greater time spent on math instruction in the Asian schools than the American schools, differences were found between the Asian and American parents. The American parents had much lower expectations for their children's education and achievement than did the Asian parents. Also, the American parents were more likely to believe that their children's math achievement was due to innate ability; the Asian parents were more likely to say that their children's math achievement was the consequence of effort and training (see Figure 10.6). The Asian students were more likely to do math homework than were the American students, and the Asian parents were far more likely to help their children with their math homework than were the American parents (Chen & Stevenson, 1989).

Related to the differences in Asian and U.S. parents involving explanations of effort and ability, Carol Dweck (2006) described the importance of children's **mindset,** which she defines as the cognitive view individuals develop for themselves. She concludes that individuals have one of two mindsets: (1) a *fixed mindset,* in which they believe that their qualities are carved in stone and cannot change; or (2) a *growth mindset*, in which they believe their qualities can change and improve through their effort.

Dweck (2006) argued that individuals' mindsets influence whether they will be optimistic or pessimistic, what their goals will be and how hard they will strive to reach those goals, and what they will achieve. Dweck says that mindsets begin to be shaped in childhood as children interact with parents, teachers, and coaches, who themselves have either a fixed mindset or a growth mindset. She described the growth mindset of Chicago 2nd-grade teacher Marva Collins, a masterful teacher. Collins' goal is to change apathetic, fixed-mindset children into growth-mindset children. On the first day of school, she tells her students, many of whom are repeating the 2nd grade,

> Well, goodbye to failure children. Welcome to success. You will read hard books in here and understand what you read. You will write every day. . . . But you must help me to help you. If you don't give anything, don't expect anything. Success is not coming to you, you must come to it. (Dweck, 2006, pp. 188–189)

Marva Collins' 2nd-grade students usually have to start off with the lowest level of reader available but by the end of the school year, most of the students are reading at the 5th-grade level.

Related to her emphasis on encouraging students to develop a growth mindset, Dweck and her colleagues (Blackwell & Dweck, 2008; Blackwell & others, 2007; Dweck & Master, 2009) have recently incorporated information about the brain's plasticity into their effort to improve students' motivation to achieve and succeed. In one study, they assigned two groups of students to eight sessions of either (1) study skills instruction, or (2) study skills instruction plus information about the importance of developing a growth mindset (called incremental theory in the research) (Blackwell & others, 2007). One of the exercises in the growth-mindset group was titled, "You Can Grow Your Brain," which emphasized that the brain is like a muscle that can change and grow as it gets exercises and develops new connections. Students were informed that the more you challenge your brain to learn, the more your brain cells

Marva Collins, challenging a child to achieve.

mindset The cognitive view, either fixed or growth, that individuals develop for themselves.

grow. Both groups had a pattern of declining math scores prior to the intervention. Following the intervention, the group who only received the study skills instruction continued to decline, but the group that received the combination of study skills instruction plus the growth-mindset emphasis on how the brain develops when it is challenged reversed the downward trend and improved their math achievement.

In other work, Dweck has been creating a computer-based workshop, "Brainology," to teach students that their intelligence can change (Blackwell & Dweck, 2008). Students experience six modules about how the brain works and how the students can make their brain improve. After being tested in 20 New York City schools recently, students strongly endorsed the value of the computer-based brain modules. Said one student, "I will try harder because I know that the more you try, the more your brain knows." (Dweck & Master, 2009, p. 137).

Review *Connect* Reflect

LG4 Characterize aspects of schooling in children's development in middle and late childhood.

Review

- What are two major contemporary issues in educating children?
- How do socioeconomic status, ethnicity, and culture influence schooling?

Connect

- One of Carol Dweck's exercises in the growth-mindset group was titled, "You Can Grow Your Brain." Can you actually grow your brain? What physical changes, if any, are still occurring in the brain in middle and late childhood?

Reflect *Your Own Personal Journey of Life*

- How would you rate the quality of your teachers in elementary school? Were their expectations for your achievement too low or too high?

topical **connections**

In adolescence, children begin spending more time thinking about their identity—who they are, what they are all about, and where they are going in life. Time spent with peers increases in adolescence and friendships become more intense and intimate. Dating and romantic relationships also become more central to the lives of most adolescents. Parents continue to have an important influence on adolescent development. Having good relationships with parents provides support for adolescents as they seek more autonomy and explore a widening social world. Problems that adolescents can develop include juvenile delinquency and depression.

looking ***forward***

reach your **learning goals**

Socioemotional Development in Middle and Late Childhood

1 Emotional and Personality Development

LG1 Discuss emotional and personality development in middle and late childhood.

The Self

- In middle and late childhood, self-understanding increasingly involves social and psychological characteristics, including social comparison. Children increase their perspective taking in middle and late childhood, and their social understanding shows increasing psychological sophistication as well. Self-concept refers to domain-specific evaluations of the self. Self-esteem refers to global evaluations of the self and is also referred to as self-worth or self-image. Self-esteem is only moderately related to school performance but is more strongly linked to initiative. Four ways to increase self-esteem are to (1) identify the causes of low self-esteem, (2) provide emotional support and social approval, (3) help children achieve, and (4) help children cope. Self-efficacy is the belief that one can master a situation and produce positive outcomes. Bandura believes that self-efficacy is a critical factor in whether students will achieve. Schunk argues that self-efficacy influences a student's choice of tasks, with low-efficacy students avoiding many learning tasks. The development of self-regulation is an important aspect of children's development. Erikson's fourth stage of development, industry versus inferiority, characterizes the middle and late childhood years.

Emotional Development

- Developmental changes in emotion include increased understanding of complex emotions such as pride and shame, detecting that more than one emotion can be experienced in a particular situation, taking into account the circumstances that led up to an emotional reaction, improvements in the ability to suppress and conceal negative emotions, and using self-initiated strategies to redirect feelings. As children get older, they use a greater variety of coping strategies and more cognitive strategies.

Moral Development

- Kohlberg argued that moral development consists of three levels—preconventional, conventional, and postconventional—and six stages (two at each level). Kohlberg maintained that these stages were age-related. Influences on movement through the stages include cognitive development, imitation and cognitive conflict, peer relations, and perspective taking. Criticisms of Kohlberg's theory have been made, especially by Gilligan, who advocates a stronger care perspective. Other criticisms focus on the inadequacy of moral reasoning to predict moral behavior, culture and family influences, and the distinction between moral reasoning and social conventional reasoning. Prosocial behavior involves positive moral behaviors such as sharing. Most sharing in the first three years is not done for empathy, but at about 4 years of age empathy contributes to sharing. By the start of the elementary school years, children express objective ideas about fairness. By the mid- to late elementary school years, children believe equity can mean that others with special needs/merit deserve special treatment. Recently, there has been a surge of interest in moral personality.

Gender

- Gender stereotypes are widespread around the world. A number of physical differences exist between males and females. Some experts argue that cognitive differences between males and females have been exaggerated. In terms of socioemotional differences, males are more physically aggressive than females, whereas females regulate their emotions better and engage in more prosocial behavior than males. Gender-role classification focuses on how masculine, feminine, or androgynous individuals are. Androgyny means having both positive feminine and masculine characteristics. It is important to think about gender in terms of context.

2 Families

LG2 Describe developmental changes in parent-child relationships, parents as managers, and societal changes in families.

Developmental Changes in Parent-Child Relationships	• Parents spend less time with children during middle and late childhood than in early childhood. Parents especially play an important role in supporting and stimulating children's academic achievement. Discipline changes and control is more coregulatory.
Parents as Managers	• Parents have important roles as managers of children's opportunities, as monitors of their behavior, and social initiators and arrangers. Mothers are more likely to function in these parental management roles than fathers.
Stepfamilies	• As in divorced families, children living in stepparent families have more adjustment problems than their counterparts in nondivorced families. However, a majority of children in stepfamilies do not have adjustment problems. Children in complex (blended) stepfamilies have more problems than children in simple stepfamilies or nondivorced families.

3 Peers

LG3 Identify changes in peer relationships in middle and late childhood.

Developmental Changes	• Among the developmental changes in peer relations in middle and late childhood are increased preference for same-sex groups, an increase in time spent in peer interaction and the size of the peer group, and less supervision of the peer group by adults.
Peer Status	• Popular children are frequently nominated as a best friend and are rarely disliked by their peers. Average children receive an average number of both positive and negative nominations from their peers. Neglected children are infrequently nominated as a best friend but are not disliked by their peers. Rejected children are infrequently nominated as a best friend and are actively disliked by their peers. Controversial children are frequently nominated both as a best friend and as being disliked by peers. Rejected children are especially at risk for a number of problems.
Social Cognition	• Social information-processing skills and social knowledge are two important dimensions of social cognition in peer relations.
Bullying	• Significant numbers of children are bullied, and this can result in short-term and long-term negative effects for both the victims and bullies.
Friends	• Like adult friends, children who are friends tend to be similar to each other. Children's friendships serve six functions: companionship, stimulation, physical support, ego support, social comparison, and intimacy/affection.

4 Schools

LG4 Characterize aspects of schooling in children's development in middle and late childhood.

Contemporary Approaches to Student Learning	• Two contemporary issues involve whether it is best to educate students by using a constructivist approach (a learner-centered approach) or a direct instruction approach (a teacher-centered approach) and how to hold teachers accountable for whether children are learning. In the United States, standardized testing of elementary school students has been mandated by both many state governments and by the No Child Left Behind federal legislation. Numerous criticisms of NCLB have been made.
Socioeconomic Status, Ethnicity, and Culture	• Children in poverty face many barriers to learning at school as well as at home. The effects of SES and ethnicity on schools are intertwined as many U.S. schools are segregated. Low expectations for ethnic minority children represent one of the barriers to their learning. American children are more achievement-oriented than

children in many countries but are less achievement-oriented than many children in Asian countries such as China, Taiwan, and Japan. Mindset is the cognitive view, either fixed or growth, that individuals develop for themselves. Dweck argues that a key aspect of children's development is to guide them in developing a growth mindset.

key terms

perspective taking 314
self-esteem 315
self-concept 315
self-efficacy 316
preconventional reasoning 320
heteronomous morality 320
individualism, instrumental purpose, and exchange 320
conventional reasoning 320
mutual interpersonal expectations, relationships, and interpersonal conformity 320
social systems morality 321
postconventional reasoning 321
social contract or utility and individual rights 321
universal ethical principles 321
justice perspective 323
care perspective 323
social conventional reasoning 323
gender stereotypes 324
androgyny 327
popular children 332
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section **six**

In no order of things is adolescence the simple time of life.

—Jean Erskine Stewart
American Writer, 20th Century

Adolescence

Adolescents try on one face after another, seeking to find a face of their own. Their generation of young people is the fragile cable by which the best and the worst of their parents' generation is transmitted to the present. In the end, there are only two lasting bequests parents can leave youth—one being roots, the other wings. Section 6 contains two chapters: "Physical and Cognitive Development in Adolescence" (Chapter 11) and "Socioemotional Development in Adolescence" (Chapter 12).

chapter 11

PHYSICAL AND COGNITIVE DEVELOPMENT IN ADOLESCENCE

chapter **outline**

1 The Nature of Adolescence

Learning Goal 1 Discuss the nature of adolescence.

2 Physical Changes

Learning Goal 2 Describe the changes involved in puberty as well as the changes in the brain and sexuality during adolescence.

Puberty
The Brain
Adolescent Sexuality

3 Issues in Adolescent Health

Learning Goal 3 Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Adolescent Health
Substance Use and Abuse
Eating Disorders

4 Adolescent Cognition

Learning Goal 4 Explain cognitive changes in adolescence.

Piaget's Theory
Adolescent Egocentrism
Information Processing

5 Schools

Learning Goal 5 Summarize some key aspects of how schools influence adolescent development.

The Transition to Middle or Junior High School
Effective Schools for Young Adolescents
High School
Extracurricular Activities
Service Learning

Fifteen-year-old Latisha developed a drinking problem, and she was kicked off the cheerleading squad for missing practice so often—but that didn't stop her drinking. She and her friends began skipping school regularly so they could drink. Fourteen-year-old Arnie is a juvenile delinquent. Last week he stole a TV set, struck his mother and bloodied her face, broke some streetlights in the neighborhood, and threatened a boy with a wrench and hammer.

Twelve-year-old Katie, more than just about anything else, wanted a playground in her town. She knew that the other kids also wanted one, so she put together a group that generated funding ideas for the playground. They presented their ideas to the town council. Her group involved more youth, and they raised money by selling candy and sandwiches door-to-door. The playground became a reality, a place where, as Katie says, "People have picnics and make friends." Katie's advice: "You won't get anywhere if you don't try."

Adolescents like Latisha and Arnie are the ones we hear about the most. But there are many adolescents like Katie who contribute in positive ways to their community and competently make the transition through adolescence. Indeed, for most adolescents, adolescence is not a time of rebellion, crisis, pathology, and deviance. A far more accurate vision of adolescence is that it is a time of evaluation, decision making, commitment, and carving out a place in the world. Most of the problems of today's youth are not with the youth themselves. What adolescents need is access to a range of legitimate opportunities and to long-term support from adults who care deeply about them (Balsano, Theokas, & Bobek, 2009; Lerner & others, 2009; Swanson, Edwards, & Spencer, 2010).

topical **connections**

In middle and late childhood, physical growth continues but at a slower pace than in infancy and early childhood. Gross motor skills become much smoother and more coordinated, and fine motor skills also improve. Significant advances in the development of the prefrontal cortex occur. Cognitive and language skills also improve considerably. In terms of cognitive development, most children become concrete operational thinkers, long-term memory increases, and metacognitive skills improve, especially if children learn a rich repertoire of strategies. In terms of language development, children's understanding of grammar and syntax increases, and learning to read becomes an important achievement.

looking ***back***

preview

Adolescence is a transitional period in the human life span, linking childhood and adulthood. We begin the chapter by examining some general characteristics of adolescence followed by coverage of major physical changes and health issues of adolescence. Then we consider the significant cognitive changes that characterize adolescence and various aspects of schools for adolescents.

1 The Nature of Adolescence

LG1 Discuss the nature of adolescence.

Growing up has never been easy. However, adolescence is not best viewed as a time of rebellion, crisis, pathology, and deviance. A far more accurate vision of adolescence describes it as a time of evaluation, of decision making, of commitment, and of carving out a place in the world. Most of the problems of today's youth are not with the youth themselves. What adolescents need is access to a range of legitimate opportunities and to long-term support from adults who deeply care about them. *What might be some examples of such support and caring?*

As in development during childhood, genetic/biological and environmental/social factors influence adolescent development. During their childhood years of development, adolescents experienced thousands of hours of interactions with parents, peers, and teachers, but now they face dramatic biological changes, new experiences, and new developmental tasks. Relationships with parents take a different form, moments with peers become more intimate, and dating occurs for the first time, as do sexual exploration and possibly intercourse. The adolescent's thoughts are more abstract and idealistic. Biological changes trigger a heightened interest in body image. Adolescence has both continuity and discontinuity with childhood.

There is a long history of worrying about how adolescents will "turn out." In 1904, G. Stanley Hall proposed the "storm-and-stress" view that adolescence is a turbulent time charged with conflict and mood swings. However, when Daniel Offer and his colleagues (1988) studied the self-images of adolescents in the United States, Australia, Bangladesh, Hungary, Israel, Italy, Japan, Taiwan, Turkey, and West Germany, at least 73 percent of the adolescents displayed a healthy self-image. Although there were differences among them, the adolescents were happy most of the time, they enjoyed life, they perceived themselves as able to exercise self-control, they valued work and school, they felt confident about their sexual selves, they expressed positive feelings toward their families, and they felt they had the capability to cope with life's stresses: not exactly a storm-and-stress portrayal of adolescence.

Public attitudes about adolescence emerge from a combination of personal experience and media portrayals, neither of which produces an objective picture of how normal adolescents develop (Feldman & Elliott, 1990). Some of the readiness to assume the worst about adolescents likely involves the short memories of adults. Many adults measure their current perceptions of adolescents by their memories of their own adolescence. Adults may portray today's adolescents as more troubled, less respectful, more self-centered, more assertive, and more adventurous than they were.

However, in matters of taste and manners, the young people of every generation have seemed unnervingly radical and different from adults—different in how they look, in how they behave, in the music they enjoy, in their hairstyles, and in the clothing they choose. It is an enormous error, though, to confuse adolescents' enthusiasm for trying on new identities and enjoying moderate amounts of outrageous behavior with hostility toward parental and societal standards. Acting out and boundary testing are time-honored ways in which adolescents move toward accepting, rather than rejecting, parental values.

Most adolescents negotiate the lengthy path to adult maturity successfully, but too large a group does not (Lerner, Roeser, & Phelps, 2009). Ethnic, cultural, gender, socioeconomic, age, and lifestyle differences influence the actual life trajectory of every adolescent (Schlegel, 2009; Swanson, Edwards, & Spencer, 2010). Different portrayals of adolescence emerge, depending on the particular group of adolescents being described (Fuligni, Hughes, & Way, 2009). Today's adolescents are exposed to a complex menu of lifestyle options through the media, and many face the temptations of drug use and sexual activity at increasingly young ages. Too many adolescents are not provided with adequate opportunities and support to become competent adults (McLoyd & others, 2009).

Review *Connect* Reflect

LG1 Discuss the nature of adolescence.

Review

- What characterizes adolescent development?

Connect

- The last line of the previous section mentioned opportunities and support during adolescence. In the previous chapters, what did you learn about the role parents play in their children's lives *leading up to* adolescence that can affect the adolescent years?

Reflect *Your Own Personal Journey of Life*

- Was your adolescence better described as a stormy and stressful time or as one of trying out new identities as you sought to find an identity of your own? Explain.

2 Physical Changes

LG2 Describe the changes involved in puberty, as well as the changes in the brain and sexuality during adolescence.

Puberty

The Brain

Adolescent Sexuality

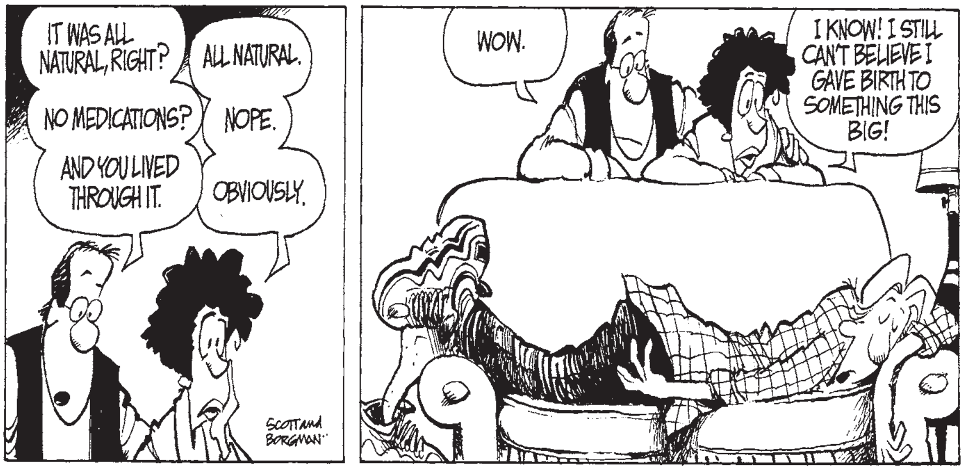
One father remarked that the problem with his teenage son was not that he grew, but that he did not know when to stop growing. As we will see, there is considerable variation in the timing of the adolescent growth spurt. In addition to pubertal changes, other physical changes we will explore involve sexuality and the brain.

PUBERTY

Puberty is not the same as adolescence. For most of us, puberty ends long before adolescence does, although puberty is the most important marker of the beginning of adolescence. **Puberty** is a period of rapid physical maturation involving hormonal and bodily changes that occurs primarily during early adolescence. Puberty is not a single, sudden event. We know whether a young boy or girl is going

puberty A period of rapid physical maturation, occurring primarily in early adolescence, that involves hormonal and bodily changes.

ZITS By Jerry Scott and Jim Borgman


IT WAS ALL NATURAL, RIGHT?
ALL NATURAL.
NO MEDICATIONS?
NOPE.
AND YOU LIVED THROUGH IT.
OBVIOUSLY.
SCOTT AND BORGMAN
WOW.
I KNOW! I STILL CAN'T BELIEVE I GAVE BIRTH TO SOMETHING THIS BIG!

ZITS © ZITS Partnership. King Features Syndicate.

through puberty, but pinpointing puberty's beginning and end is difficult. Among the most noticeable changes are signs of sexual maturation and increases in height and weight.

Sexual Maturation, Height, and Weight Think back to the onset of your puberty. Of the striking changes that were taking place in your body, what was the first to occur? Researchers have found that male pubertal characteristics typically develop in this order: increase in penis and testicle size, appearance of straight pubic hair, minor voice change, first ejaculation (which usually occurs through masturbation or a wet dream), appearance of kinky pubic hair, onset of maximum growth in height and weight, growth of hair in armpits, more detectable voice changes, and, finally, growth of facial hair.

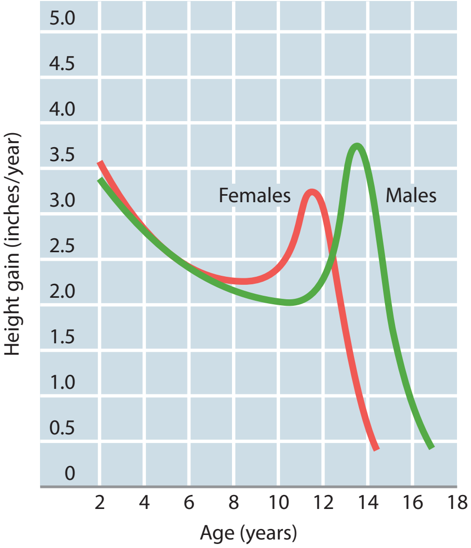


FIGURE **11.1**

PUBERTAL GROWTH SPURT. On average, the peak of the growth spurt during puberty occurs two years earlier for girls (11½) than for boys (13½). *How are hormones related to the growth spurt and to the difference between the average height of adolescent boys and that of girls?*

What is the order of appearance of physical changes in females? First, either the breasts enlarge or pubic hair appears. Later, hair appears in the armpits. As these changes occur, the female grows in height and her hips become wider than her shoulders. **Menarche**—a girl's first menstruation—comes rather late in the pubertal cycle. Initially, her menstrual cycles may be highly irregular. For the first several years, she may not ovulate every menstrual cycle; some girls do not ovulate at all until a year or two after menstruation begins. No voice changes comparable to those in pubertal males occur in pubertal females. By the end of puberty, the female's breasts have become more fully rounded.

Marked weight gains coincide with the onset of puberty. During early adolescence, girls tend to outweigh boys, but by about age 14 boys begin to surpass girls. Similarly, at the beginning of the adolescent period, girls tend to be as tall as or taller than boys of their age, but by the end of the middle school years most boys have caught up or, in many cases, surpassed girls in height.

As indicated in Figure 11.1, the growth spurt occurs approximately two years earlier for girls than for boys. The mean age at the beginning of the growth spurt in girls is 9; for boys, it is 11. The peak rate of pubertal change occurs at 11½ years for girls and 13½ years for boys. During their growth spurt, girls increase in height about 3½ inches per year, boys about 4 inches. Boys and girls who are shorter or taller than their peers before adolescence are likely to remain so during adolescence; however, as much as 30 percent of an individual's height in late adolescence is unexplained by his or her height in the elementary school years.

Hormonal Changes Behind the first whisker in boys and the widening of hips in girls is a flood of **hormones,** powerful chemical substances secreted by the

menarche A girl's first menstruation.

hormones Powerful chemical substances secreted by the endocrine glands and carried through the body by the bloodstream.

endocrine glands and carried through the body by the bloodstream (Susman & Dorn, 2009; Wankowska & Polkowska, 2010).

The concentrations of certain hormones increase dramatically during adolescence (Roa & others, 2010). *Testosterone* is a hormone associated in boys with the development of genitals, an increase in height, and a change in voice. *Estradiol* is a type of estrogen; in girls it is associated with breast, uterine, and skeletal development. In one study, testosterone levels increased eighteen-fold in boys but only twofold in girls during puberty; estradiol increased eightfold in girls but only twofold in boys (Nottelmann & others, 1987). Thus, both testosterone and estradiol are present in the hormonal makeup of both boys and girls, but testosterone dominates in male pubertal development, estradiol in female pubertal development.

The same influx of hormones that grows hair on a male's chest and increases the fatty tissue in a female's breasts may also contribute to psychological development in adolescence (Susman & Dorn, 2009). In one study of boys and girls ranging in age from 9 to 14, a higher concentration of testosterone was present in boys who rated themselves as more socially competent (Nottelmann & others, 1987). However, hormonal effects by themselves do not account for adolescent development (Susman & Dorn, 2009). For example, in one study, social factors were much better predictors of young adolescent girls' depression and anger than hormonal factors (Brooks-Gunn & Warren, 1989). Behavior and moods also can affect hormones (DeRose & Brooks-Gunn, 2008). Stress, eating patterns, exercise, sexual activity, tension, and depression can activate or suppress various aspects of the hormonal system (Sontag & others, 2008). In sum, the hormone-behavior link is complex.

developmental **connection**

Life-span Perspective. Biological, cognitive, and socioemotional processes interact in development. Chapter 1, p. 15

Timing and Variations in Puberty In the United States—where children mature up to a year earlier than children in European countries—the average age of menarche has declined significantly since the mid-19th century (see Figure 11.2). Fortunately, however, we are unlikely to see pubescent toddlers, since what has happened in the past century is likely the result of improved nutrition and health.

Why do the changes of puberty occur when they do, and how can variations in their timing be explained? The basic genetic program for puberty is wired into the species (Gajdos, Hirschhorn, & Palmert, 2009), but nutrition, health, and other environmental factors also affect puberty's timing and makeup (Ji & Chen, 2008).

For most boys, the pubertal sequence may begin as early as age 10 or as late as 13½, and may end as early as age 13 or as late as 17. Thus the normal range is wide enough that, given two boys of the same chronological age, one might complete the pubertal sequence before the other one has begun it. For girls, menarche is considered within the normal range if it appears between the ages of 9 and 15. An increasing number of U.S. girls are beginning puberty at 8 and 9 years of age, with African American girls developing earlier than non-Latino White girls (Herman-Giddens, 2007).

Precocious puberty is the term used to describe the very early onset and rapid progression of puberty. Judith Blakemore and her colleagues (2009) recently described the following characteristics of precocious puberty. Precocious puberty is usually diagnosed when the onset of puberty happens before 8 years of age in girls and before 9 years of age in boys. Precocious puberty occurs about 10 times more often in girls than in boys. Precocious puberty usually is treated by medically suppressing gonadotropic secretions, which temporarily halts pubertal change. This treatment is usually given because children who experience precocious puberty are eventually likely to have short stature, early sexual capability, and the potential for engaging in age-inappropriate behavior (Blakemore, Berenbaum, & Liben, 2009).

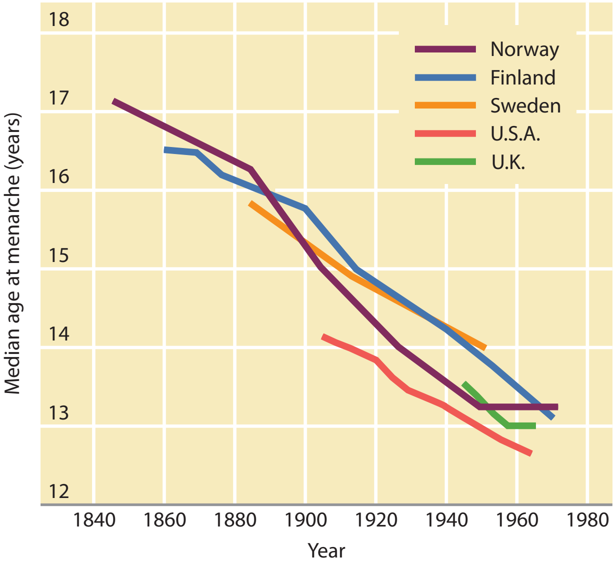


FIGURE **11.2**

MEDIAN AGES AT MENARCHE IN SELECTED NORTHERN EUROPEAN COUNTRIES AND THE UNITED STATES FROM 1845 TO 1969. Notice the steep decline in the age at which girls experienced menarche in four northern European countries and the United States from 1845 to 1969. Recently the age at which girls experience menarche has been leveling off.

precocious puberty The very early onset and rapid progression of puberty.

Adolescents show a strong preoccupation with their changing bodies and develop images of what their bodies are like. *Why might adolescent males have more positive body images than adolescent females?*

Body Image One psychological aspect of physical change in puberty is certain: Adolescents are preoccupied with their bodies and develop images of what their bodies are like (Mueller, 2009). Preoccupation with body image is strong throughout adolescence, but it is especially acute during early adolescence, a time when adolescents are more dissatisfied with their bodies than in late adolescence.

Gender differences characterize adolescents' perceptions of their bodies. In general, girls are less happy with their bodies and have more negative body images than boys throughout puberty (Bearman & others, 2006). As pubertal change proceeds, girls often become more dissatisfied with their bodies, probably because their body fat increases. In contrast, boys become more satisfied as they move through puberty, probably because their muscle mass increases.

Early and Late Maturation Some of you entered puberty early, others late, and still others on time. Adolescents who mature earlier or later than their peers perceive themselves differently (Susman & Dorn, 2009). In the Berkeley Longitudinal Study some years ago, early-maturing boys perceived themselves more positively and had more successful peer relations than did their late-maturing counterparts (Jones, 1965). When the late-maturing boys were in their thirties, however, they had developed a stronger sense of identity than the early-maturing boys had (Peskin, 1967). This may have occurred because the late-maturing boys had more time to explore life's options, or because the early-maturing boys continued to focus on their advantageous physical status instead of on career development and achievement. More recent research confirms, though, that at least during adolescence it is advantageous to be an early-maturing rather than a late-maturing boy (Graber, Brooks-Gunn, & Warren, 2006).

For girls, early and late maturation have been linked with body image. In the sixth grade, early-maturing girls show greater satisfaction with their figures than do late-maturing girls, but by the tenth grade late-maturing girls are more satisfied (Simmons & Blyth, 1987) (see Figure 11.3). One possible reason for this is that in late adolescence early-maturing girls are shorter and stockier, whereas late-maturing girls are taller and thinner. Thus, late-maturing girls in late adolescence have bodies that more closely approximate the current American ideal of feminine beauty—tall and thin.

An increasing number of researchers have found that early maturation increases girls' vulnerability to a number of problems (Cavanagh, 2009; Ge & Natsuaki, 2010). Early-maturing girls are more likely to smoke, drink, be depressed, have an eating disorder, struggle for earlier independence from their parents, and have older friends; and their bodies are likely to elicit responses from males that lead to earlier dating and earlier sexual experiences (Wiesner & Ittel, 2002). Early maturing girls also are less likely to graduate from high school and they cohabit and marry earlier (Cavanagh, 2009).

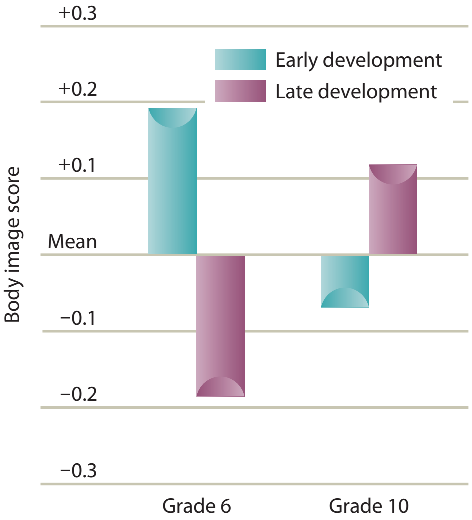


FIGURE **11.3**

EARLY- AND LATE-MATURING ADOLESCENT GIRLS' PERCEPTIONS OF BODY IMAGE IN EARLY AND LATE ADOLESCENCE. The sixth-grade girls in this study had positive body image scores if they were early-maturers but negative body image scores if they were late-maturers (Simmons & Blyth, 1987). Positive body image scores indicated satisfaction with their figures. By the 10th grade, however, it was the late-maturers who had positive body image scores.

THE BRAIN

Along with the rest of the body, the brain is changing during adolescence, but the study of adolescent brain development is in its infancy. As advances in technology take place, significant strides will also likely be made in charting developmental changes in the adolescent brain (Paus, 2009; Steinberg, 2009). What do we know now?

Recall from our discussion of the brain's development in Chapter 4 researchers' discovery that nearly twice as many synaptic connections are made than will ever be used (Huttenlocher & Dabholkar, 1997). The connections that are used are strengthened and survive, while the unused ones are replaced by other pathways or disappear. That is, in the language of neuroscience, these connections will be "pruned." What results from this pruning is that by the end of adolescence individuals have "fewer, more selective, more effective neuronal connections than they did as children" (Kuhn, 2009, p. 153). And this pruning indicates that the activities adolescents choose to engage in and not to engage in influence which neural connections will be strengthened and which will disappear.

Using fMRI brain scans, scientists have recently discovered that adolescents' brains undergo significant structural changes (Bava & others, 2010; Lenroot & others, 2009). The **corpus callosum,** where fibers connect the brain's left and right hemispheres, thickens in adolescence, and this improves adolescents' ability to process information (Giedd, 2008). We described advances in the development of the *prefrontal cortex*—the highest level of the frontal lobes involved in reasoning, decision making, and self-control—in Chapter 9. However, the prefrontal cortex doesn't finish maturing until the emerging adult years, approximately 18 to 25 years of age, or later, whereas the **amygdala**—the seat of emotions such as anger—matures earlier than the prefrontal cortex. Figure 11.4 shows the locations of the corpus callosum, prefrontal cortex, and amygdala.

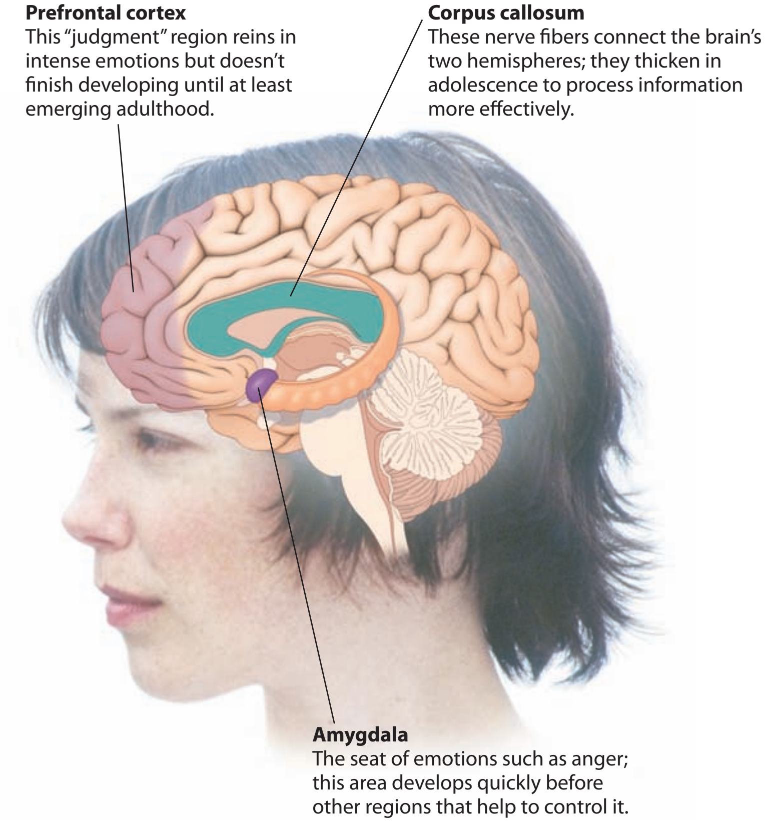

Prefrontal cortex
This "judgment" region reins in intense emotions but doesn't finish developing until at least emerging adulthood.
Corpus callosum
These nerve fibers connect the brain's two hemispheres; they thicken in adolescence to process information more effectively.
Amygdala
The seat of emotions such as anger; this area develops quickly before other regions that help to control it.

FIGURE **11.4**
CHANGES IN THE ADOLESCENT BRAIN

Many of the changes in the adolescent brain that have been described involve the rapidly emerging field of *social developmental neuroscience*, which involves connections between development, the brain, and socioemotional processes (de Haan & Gunnar, 2009). For example, consider leading researcher Charles Nelson's (2003) view that, although adolescents are capable of very strong emotions, their prefrontal cortex hasn't adequately developed to the point at which they can control these passions. It is as if their brain doesn't have the brakes to slow down their emotions. Or consider this interpretation of the development of emotion and cognition in adolescents: "early activation of strong 'turbo-charged' feelings with a relatively unskilled set of 'driving skills' or cognitive abilities to modulate strong emotions and motivations" (Dahl, 2004, p. 18).

Of course, a major issue is which comes first, biological changes in the brain or experiences that stimulate these changes (Lerner, Boyd, & Du, 2008)? Consider a recent study in which the prefrontal cortex thickened and more brain connections formed when adolescents resisted peer pressure (Paus & others, 2007). Scientists have yet to determine whether the brain changes come first or whether the brain changes are the result of experiences with peers, parents, and others. Once again, we encounter the nature-nurture issue that is so prominent in an examination of development through the life span.

developmental **connection**

Brain Development. Although the prefrontal cortex shows considerable development in childhood, it is still not fully mature in adolescence. Chapter 9, p. 278

> Sexual arousal emerges as a new phenomenon in adolescence and it is important to view sexuality as a normal aspect of adolescent development.
>
> —Shirley Feldman
>
> *Contemporary Psychologist, Stanford University*

ADOLESCENT SEXUALITY

Not only is adolescence characterized by substantial changes in physical growth and the development of the brain, but adolescence also is a bridge between the asexual child and the sexual adult. Adolescence is a time of sexual exploration and experimentation, of sexual fantasies and realities, of incorporating sexuality into one's identity. Adolescents have an almost insatiable curiosity about sexuality. They are concerned about whether they are sexually attractive, how to do sex, and what the future holds for their sexual lives. Although most adolescents experience times of vulnerability and confusion, the majority will eventually develop a mature sexual identity. In the United States, the information about sexuality is widely available to

corpus callosum The location where fibers connect the brain's left and right hemispheres.

amygdala The region of the brain that is the seat of emotions.

adolescents. They learn a great deal about sex from television, videos, magazines, the lyrics of popular music, and Web sites (Epstein & Ward, 2008).

How might watching sex on television be linked to adolescents' sexual activity? A recent research review concluded that adolescents who view more sexual content on TV are more likely to initiate sexual intercourse earlier than their peers who view less sexual content on TV (Brown & Strasburger, 2007). Further, a recent study of adolescent girls across a three-year period revealed a link between watching sex on TV and subsequent higher risk of pregnancy (Chandra & others, 2008).

SKYY VODKA
31'5"x27
World Travellers' Club

Adolescents are exposed to sex virtually everywhere in the American culture and sex is used to sell just about everything.

Developing a Sexual Identity Mastering emerging sexual feelings and forming a sense of sexual identity are multifaceted and lengthy processes (Diamond & Savin-Williams, 2009). They involve learning to manage sexual feelings (such as sexual arousal and attraction), developing new forms of intimacy, and learning the skills to regulate sexual behavior to avoid undesirable consequences. Developing a sexual identity also involves more than just sexual behavior. Sexual identities emerge in the context of physical factors, social factors, and cultural factors, with most societies placing constraints on the sexual behavior of adolescents.

An adolescent's sexual identity involves activities, interests, styles of behavior, and an indication of sexual orientation (whether an individual has same-sex or other-sex attractions) (Buzwell & Rosenthal, 1996). For example, some adolescents have a high anxiety level about sex, others a low level. Some adolescents are strongly aroused sexually, others less so. Some adolescents are very active sexually, others not at all. Some adolescents are sexually inactive in response to their strong religious upbringing; others go to church regularly, yet their religious training does not inhibit their sexual activity (Thorton & Camburn, 1989).

It is commonly thought that most gays and lesbians quietly struggle with same-sex attractions in childhood, do not engage in heterosexual dating, and gradually recognize that they are a gay or lesbian in mid- to late adolescence. Many youth do follow this developmental pathway, but others do not (Diamond & Savin-Williams, 2009). For example, many youth have no recollection of early same-sex attractions and experience a more abrupt sense of their same-sex attraction in late adolescence. The majority of adolescents with same-sex attractions also experience some degree of other-sex attractions. Even though some adolescents who are attracted to individuals of their same sex fall in love with these individuals, others claim that their same-sex attractions are purely physical (Diamond & Savin-Willams, 2009).

In sum, gay and lesbian youth have diverse patterns of initial attraction, often have bisexual attractions, and may have physical or emotional attraction to same-sex individuals but do not always fall in love with them (Diamond & Savin-Williams, 2009). In Chapter 13, "Physical and Cognitive Development in Early Adulthood," we will further explore same-sex and heterosexual attraction.

developmental **connection**

Sexuality. What characterizes the sexual activity of emerging adults (18 to 25 years of age)? Chapter 13, p. 425

The Timing of Adolescent Sexual Behaviors The timing of sexual initiation varies by country as well as by gender and other socioeconomic characteristics (Eaton & others, 2008). In one cross-cultural study, among females, the proportion having first intercourse by age 17 ranged from 72 percent in Mali to 47 percent in the United States and 45 percent in Tanzania (Singh & others, 2000). The percentage of males who had their first intercourse by age 17 ranged from 76 percent in Jamaica to 64 percent in the United States and 63 percent in Brazil. Within the United States, male, African American, and inner-city adolescents report being the most sexually active, whereas Asian American adolescents are less likely to be sexually active (Feldman, Turner, & Araujo, 1999).

A national survey revealed that 63 percent of U.S. 12th-graders (64 percent of males, 62 percent of females) reported that they had experienced sexual intercourse compared with 34 percent of 9th-graders (39 percent of males, 29 percent of females) (MMWR, 2006) (see Figure 11.5). By age 20, 77 percent of U.S. youth have engaged in sexual intercourse (Dworkin & Santelli, 2007). A recent national study indicated that 35 percent of U.S. high school students were currently sexually active (Eaton & others, 2008). Another recent national study of adolescent sexual behavior from 1991 to 2007 revealed that sexual experience and having multiple sexual partners in adolescence declined from the early 1990s through the early 2000s, and then increased recently (Santelli & others, 2009).

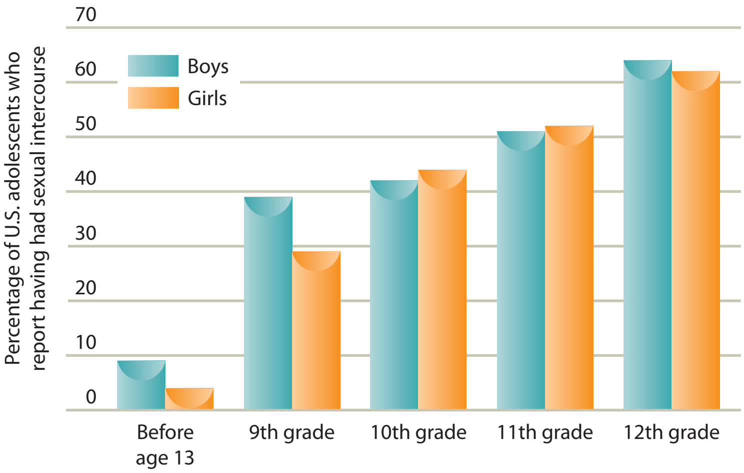


FIGURE 11.5

TIMING OF SEXUAL INTERCOURSE IN U.S. ADOLESCENTS

There has been a dramatic increase in oral sex during adolescence (Brewster & Harker Tillman, 2008). In a national survey, 55 percent of U.S. 15- to 19-year-old boys and 54 percent of girls of the same age range said they had engaged in oral sex (National Center for Health Statistics, 2002). In the survey, more than 20 percent of the adolescents who had not had sexual intercourse had engaged in oral sex.

What are some risks for early initiation of sexual intercourse?

Risk Factors in Adolescent Sexual Behavior Many adolescents are not emotionally prepared to handle sexual experiences, especially in early adolescence. Early sexual activity is linked with risky behaviors such as drug use, delinquency, and school-related problems (Dryfoos & Barkin, 2006). A recent study revealed that alcohol use, early menarche, and poor parent-child communication were linked to early sexually intimate behavior in girls (Hipwell & others, 2010).

In addition to having sex in early adolescence, other risk factors for sexual problems in adolescence include contextual factors such as socioeconomic status (SES), as well as family/parenting, peer, and academic achievement factors (Dupere & others, 2008; House & others, 2010). The percentage of sexually active young adolescents is higher in low-income areas of inner cities (Silver & Bauman, 2006). Further, having older sexually active siblings or pregnant/parenting teenage sisters places adolescents at an elevated risk of adolescent pregnancy (Miller, Benson, & Galbraith, 2001). A recent research review found that earlier onset of sexual intercourse was linked to a lower level of parental monitoring (Zimmer-Gembeck & Helfand, 2008). In another study, maternal communication about sex (the extent mothers talked with their adolescents about having sexual intercourse and the negative things that could happen if he got someone pregnant/she got pregnant, for example) was linked with less risky sexual behavior by Latino adolescents (Trejos-Castillo & Vazonyi, 2009). Also, a recent study of middle school students revealed that better academic achievement was a protective factor in keeping boys and girls from engaging in early initiation of sexual intercourse (Laflin, Wang, & Barry, 2008).

Sure, let's go
No, I'm fine
No, Jen won't find me
Click on what you want to see.

Psychologists are exploring ways to encourage adolescents to make less risky sexual decisions. Here an adolescent participates in an interactive video session developed by Julie Downs and her colleagues at the Department of Social and Decision Making Sciences at Carnegie Mellon University. The videos help adolescents evaluate their responses and decisions in high-risk sexual contexts.

Contraceptive Use Sexual activity carries with it considerable risks if appropriate safeguards are not taken. Youth encounter two kinds of risks: unintended unwanted pregnancy and sexually transmitted infections. Both of these risks can be reduced significantly if contraception is used.

The good news is that adolescents are increasing their use of contraceptives (Frost, Darroch, & Ramez, 2008). For example, a recent large-scale study revealed a substantial increase in the use of contraceptives (61.5 percent in 2007 compared with 46.2 percent in 1991) by U.S. high school students during the last time they had sexual intercourse (among students who were sexually active) (Centers for Disease Control and Prevention, 2008).

Although adolescent contraceptive use is increasing, many sexually active adolescents still do not use contraceptives, or they use them inconsistently (Parkes & others, 2009; Sterling & Saddler, 2009). Younger adolescents are less likely than older adolescents to take contraceptive precautions.

Researchers also have found that U.S. adolescents use condoms less than their counterparts in Europe. Recent studies of 15-year-olds revealed that in Europe 72 percent of the girls and 81 percent of boys used condoms at last intercourse (Currie & others, 2008); by comparison, in the U.S., 62 percent of the girls and 75 percent of the boys used condoms at last intercourse (Santelli, Sandfort, & Orr, 2009). Pill use also continues to be higher in European countries (Santelli, Sandfort, & Orr, 2009). Such comparisons provide insight into why adolescent pregnancy rates are much higher in the United States than in European countries.

developmental **connection**

Conditions, Diseases, and Disorders. What are some good strategies for protecting against HIV and other sexually transmitted infections? Chapter 13, p. 429

Sexually Transmitted Infections Some forms of contraception, such as birth control pills or implants, do not protect against sexually transmitted infections, or STIs. **Sexually transmitted infections (STIs)** are contracted primarily through sexual contact, including oral-genital and anal-genital contact. Every year more than 3 million American adolescents (about one-fourth of those who are sexually experienced) acquire an STI (Centers for Disease Control and Prevention, 2008). In a single act of unprotected sex with an infected partner, a teenage girl has a 1 percent risk of getting HIV, a 30 percent risk of acquiring genital herpes, and a 50 percent chance of contracting gonorrhea (Glei, 1999). Yet another very widespread STI is chlamydia. In Chapter 13, we will consider these and other sexually transmitted infections.

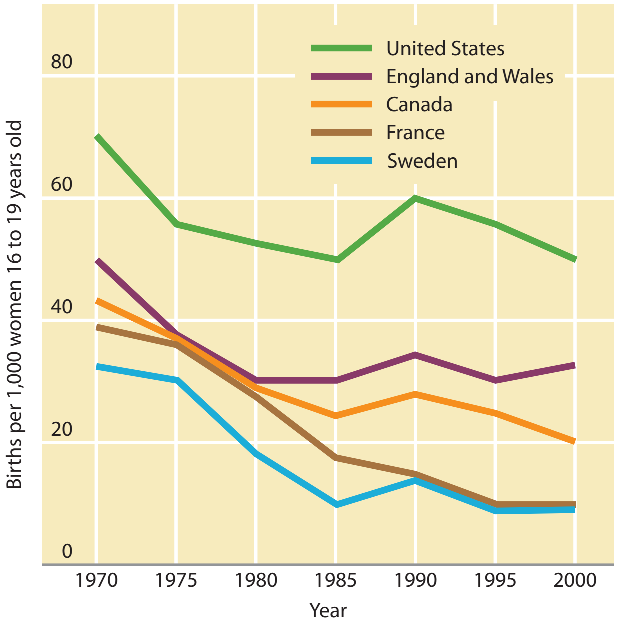


FIGURE **11.6**

CROSS-CULTURAL COMPARISONS OF ADOLESCENT PREGNANCY RATES. Pregnancy rates among U.S. adolescents are among the highest in the industrialized world (Centers for Disease Control and Prevention, 2002).

Adolescent Pregnancy In cross-cultural comparisons, the United States continues to have one of the highest adolescent pregnancy and childbearing rates in the industrialized world, despite a considerable decline in the 1990s (Cooksey, 2009). As Figure 11.6 shows, the U.S. adolescent pregnancy rate is five times as high as in Sweden. This dramatic difference exists in spite of the fact that U.S. adolescents are no more sexually active than their counterparts in Sweden.

Despite the negative comparisons of the United States with many other developed countries, there have been some encouraging trends in U.S. adolescent pregnancy rates. The rate of births to adolescent girls dropped 34 percent from 1991 to 2005. Reasons for these declines include increased contraceptive use and fear of sexually transmitted infections such as AIDS (Joyner, 2009). The adolescent birthrate then increased by 5 percent in 2005 and 2006, but resumed its downward trend in 2007 and 2008 (Hamilton, Martin, & Ventura, 2010) (see Figure 11.7).

Latina adolescents have a higher teen birthrate than non-Latina White and African American Adolescents (Santelli, Abraido-Lanza, & Melnikas, 2009). Latinas also have had the smallest recent declines in adolescent pregnancy and birthrates among ethnic groups in the United States (Ventura & others, 2008). Latina and African American adolescent girls who have a child are also more likely than non-Latina Whites to have a second child during adolescence (Rosengard, 2009).

Daughters of teenage mothers are also at risk for teenage childbearing, thus perpetuating an intergenerational cycle. A recent study using

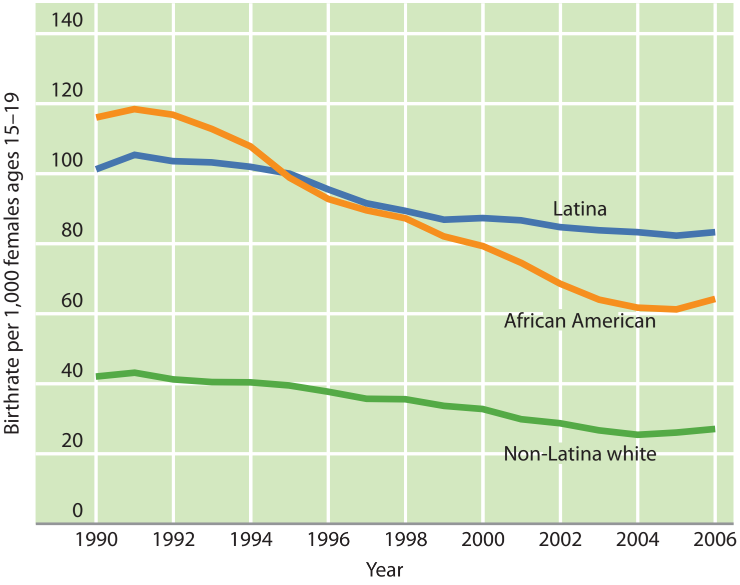


FIGURE **11.7**

U. S. ADOLESCENT BIRTHRATE BY ETHNICITY, 1990 TO 2006

What are some consequences of adolescent pregnancy?

data from the National Longitudinal Survey of Youth revealed that daughters of teenage mothers were 66 percent more likely to become teenage mothers themselves (Meade, Kershaw, & Ickovics, 2008). In this study, risks that increased the likelihood that the daughters of teenage mothers would become pregnant included low parental monitoring and poverty.

Outcomes Adolescent pregnancy creates health risks for both the baby and the mother. Infants born to adolescent mothers are more likely to have low birth weights—a prominent factor in infant mortality—as well as neurological problems and childhood illness (Chedraui, 2008). Adolescent mothers also often drop out of school. Although many adolescent mothers resume their education later in life, they generally never catch up economically with women who postpone childbearing until their twenties. One longitudinal study found that the children of women who had their first birth during their teens had lower achievement test scores and more behavioral problems than did children whose mothers had their first birth as adults (Hofferth & Reid, 2002).

Though the consequences of America's high adolescent pregnancy rate are cause for great concern, it often is not pregnancy alone that leads to negative consequences for an adolescent mother and her offspring. Adolescent mothers are more likely to come from low-SES backgrounds (Joyner, 2009). Many adolescent mothers also were not good students before they became pregnant (Malamitsi-Puchner & Boutsikou, 2006). However, not every adolescent female who bears a child lives a life of poverty and low achievement. Thus, although adolescent pregnancy is a high-risk circumstance, and adolescents who do not become pregnant generally fare better than those who do, some adolescent mothers do well in school and have positive outcomes.

Serious, extensive efforts are needed to help pregnant adolescents and young mothers enhance their educational and occupational opportunities (Key & others, 2008). Adolescent mothers also need help in obtaining competent child care and in planning for the future.

Adolescents can benefit from age-appropriate family-life education. Family and consumer science educators teach life skills, such as effective decision making, to adolescents. To read about the work of one family and consumer science educator, see *Connecting With Careers*. And to learn more about ways to reduce adolescent pregnancy, see *Connecting Development to Life*.

sexually transmitted infections (STIs) Infections that are contracted primarily through sexual contact, including oral-genital and anal-genital contact.

connecting with careers

Lynn Blankenship, Family and Consumer Science Educator

Lynn Blankenship is a family and consumer science educator. She has an undergraduate degree in this area from the University of Arizona. She has taught for more than 20 years, the last 14 at Tucson High Magnet School.

Blankenship was awarded the Tucson Federation of Teachers Educator of the Year Award for 1999–2000 and the Arizona Teacher of the Year in 1999.

Blankenship especially enjoys teaching life skills to adolescents. One of her favorite activities is having students care for an automated baby that imitates the needs of real babies. She says that this program has a profound impact on students because the baby must be cared for around the clock for the duration of the assignment. Blankenship also coordinates real-world work experiences and training for students in several child-care facilities in the Tucson area.

Lynn Blankenship (*center*) teaching life skills to students.

For more information about what family and consumer science educators do, see page 46 in the Careers in Life-Span Development appendix.

connecting development to life

Reducing Adolescent Pregnancy

One strategy for reducing adolescent pregnancy, called the Teen Outreach Program (TOP), focuses on engaging adolescents in volunteer community service and stimulates discussions that help adolescents appreciate the lessons they learn through volunteerism. In one study, 695 adolescents in grades 9 to 12 were randomly assigned to either a Teen Outreach group or a control group (Allen & others, 1997). They were assessed at both program entry and program exit nine months later. The rate of pregnancy was substantially lower for the Teen Outreach adolescents. These adolescents also had a lower rate of school failure and academic suspension.

Girls, Inc., has four programs that are intended to increase adolescent girls' motivation to avoid pregnancy until they are mature enough to make responsible decisions about motherhood (Roth & others, 1998). Growing Together, a series of five two-hour workshops for mothers and adolescents, and Will Power/Won't Power, a series of six two-hour sessions that focus on assertiveness training, are for 12- to 14-year-old girls. For older adolescent girls, Taking Care of Business provides nine sessions that emphasize career planning as well as information about sexuality, reproduction, and contraception. Health Bridge coordinates health and education services—girls can participate in this program as one of their club activities. Girls who participated in these programs were less likely to get pregnant than girls who did not participate (Girls, Inc., 1991).

The sources and the accuracy of adolescents' sexual information are linked to adolescent pregnancy. Adolescents can get information about sex from many sources, including parents, siblings, schools, peers, magazines, television, and the Internet. A special concern is the accuracy of sexual information to which adolescents have access on the Internet.

Currently, a major controversy in sex education is whether schools should have an abstinence-only program or a program that emphasizes contraceptive knowledge (Hentz & Fields, 2009). Two recent research reviews found that abstinence-only programs do not delay the initiation of sexual intercourse and do not reduce HIV risk behaviors (Kirby, Laris, & Rolleir, 2007; Underhill, Montgomery, & Operario, 2007). Further, a recent study revealed that adolescents who experienced comprehensive sex education were less likely to report adolescent pregnancies than those who were given abstinence-only sex education or no education (Kohler, Manhart, & Lafferty, 2008). A number of leading experts on adolescent sexuality conclude that sex education programs that emphasize contraceptive knowledge do not increase the incidence of sexual intercourse and are more likely to reduce the risk of adolescent pregnancy and sexually transmitted infections than abstinence-only programs (Constantine, 2008; Eisenberg & others, 2008; Dworkin & Santelli, 2007; Hentz & Fields, 2009).

Based on the information you read earlier about risk factors in adolescent sexual behavior, which segments of the adolescent population would benefit most from the types of sex education programs described here?

Review *Connect* Reflect

LG2 Describe the changes involved in puberty as well as the changes in the brain and sexuality during adolescence.

Review

- What are some key aspects of puberty?
- What changes typically occur in the brain during adolescence?
- What are some important aspects of sexuality in adolescence?

Connect

- How might adolescent brain development be linked to adolescents' decisions to or not to engage in sexual activity?

Reflect *Your Own Personal Journey of Life*

- Did you experience puberty early or late? How did this timing affect your development?

3 Issues in Adolescent Health

LG3 Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Adolescent Health

Substance Use and Abuse

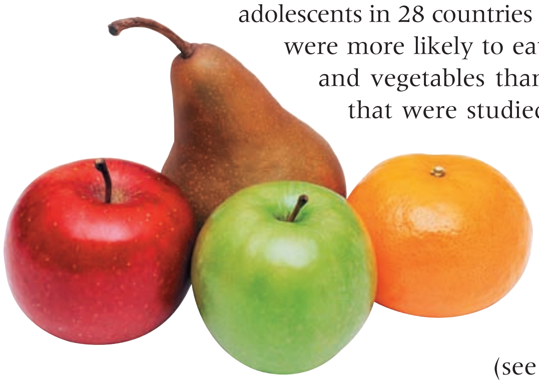
Eating Disorders

Many health experts argue that whether adolescents are healthy depends primarily on their own behavior. To improve adolescent health, adults should aim to (1) increase adolescents' *health-enhancing* behaviors, such as eating nutritiously, exercising, wearing seat belts, and getting adequate sleep; and (2) reduce adolescents' *health-compromising* behaviors, such as drug abuse, violence, unprotected sexual intercourse, and dangerous driving.

ADOLESCENT HEALTH

Adolescence is a critical juncture in the adoption of behaviors that are relevant to health (Nyaronga & Wickrama, 2009; Ozer & Irwin, 2009). Many of the behaviors that are linked to poor health habits and early death in adults begin during adolescence. Conversely, the early formation of healthy behavior patterns, such as regular exercise and a preference for foods low in fat and cholesterol, not only has immediate health benefits but helps in adulthood to delay or prevent disability and mortality from heart disease, stroke, diabetes, and cancer (Schiff, 2009).

Nutrition and Exercise Concerns are growing about adolescents' nutrition and exercise (Biro & others, 2010; Frisco, 2009; Seo & Sa, 2010). The percentage of overweight U.S. 12- to 19-year-olds increased from 11 to 17 percent from the early 1990s through 2004 (Eaton & others, 2006). A recent study found that 80 percent of the male and 92 percent of the female adolescents in the 95th percentile and higher for body mass index (BMI) became obese adults (Wang & others, 2008). A comparison of adolescents in 28 countries found that U.S. and British adolescents were more likely to eat fried food and less likely to eat fruits and vegetables than adolescents in most other countries that were studied (World Health Organization, 2000). U.S. adolescents are decreasing their intake of fruits and vegetables. The National Youth Risk Survey found that U.S. high school students decreased their intake of fruits and vegetables from 1999 through 2007 (Eaton & others, 2008) (see Figure 11.8).



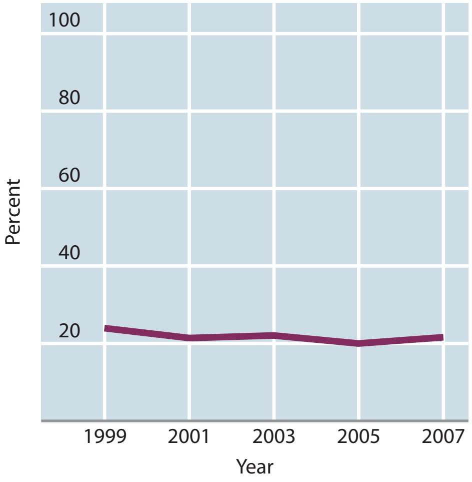


FIGURE **11.8**

PERCENTAGE OF U.S. HIGH SCHOOL STUDENTS WHO ATE FRUITS AND VEGETABLES FIVE OR MORE TIMES A DAY, 1999 TO 2007.

Note: The graph shows the percentage of high school students over time who had eaten fruits and vegetables (100% fruit juice, fruit, green salad, potatoes—excluding french fries, fried potatoes, or potato chips—carrots, or other vegetables) five or more times per day during the preceding seven days (Eaton & others, 2008).

What are some characteristics of adolescents' exercise patterns?

A special concern in American culture is the amount of fat in our diet (Frisco, 2009). Many of today's adolescents virtually live on fast-food meals, which contribute to the high fat levels in their diet. A longitudinal study revealed that frequent intake of fast food (three or more times a week) was reported by 24 percent of males and 21 percent of 15 year-old-females (Larson & others, 2008). At 20 years of age, the percent increased to 33 percent for males but remained at 21 percent for the females. And a recent study found that eating regular family meals during early adolescence was linked to healthy eating habits five years later (Burgess-Champoux & others, 2009).

Researchers have found that individuals become less active as they reach and progress through adolescence (Butcher & others, 2008). A recent national study revealed that only 31 percent of U.S. 15-year-olds met the federal government's moderate to vigorous exercise recommendations per day (a minimum of 60 minutes a day) and only 17 percent met the recommendations on weekends (Nader & others, 2008). The recent national study also found that adolescent boys were more likely to engage in moderate to vigorous exercise than were girls. Another national study of U.S. adolescents revealed that physical activity increased until 13 years of age in boys and girls but then declined through 18 years of age (Kahn & others, 2008).

Ethnic differences in exercise participation rates of U.S. adolescents also occur and these rates vary by gender. As indicated in Figure 11.9, in the National Youth Risk Survey non-Latino White boys exercised the most, African American girls the least (Eaton & others, 2008).

Exercise is linked to a number of positive physical outcomes in adolescence. One outcome is that regular exercise has a positive effect on adolescents' weight status (van der Heijden & others, 2010). A recent study revealed that regular exercise from 9 to 16 years of age was associated with regular weight in girls (McMurray & others, 2008). Other positive outcomes of exercise in adolescence are reduced triglyceride levels, lower blood pressure, and a lower incidence of type II diabetes (Butcher & others, 2008). A recent study revealed that low levels of exercise were related to depressive symptoms in young adolescents (Sund, Larsson, & Wichstrom, 2010). And another recent study found that vigorous physical activity was linked to lower drug use in adolescents (Delisle & others, 2010).

Watching television and using computers for long hours may be involved in lower levels of physical fitness in adolescence (Rey-Lopez & others, 2008). For example, a recent study revealed that the more frequently adolescents watched television and used computers, the less likely they were to engage in regular exercise (Chen, Liou, & Wu, 2008).

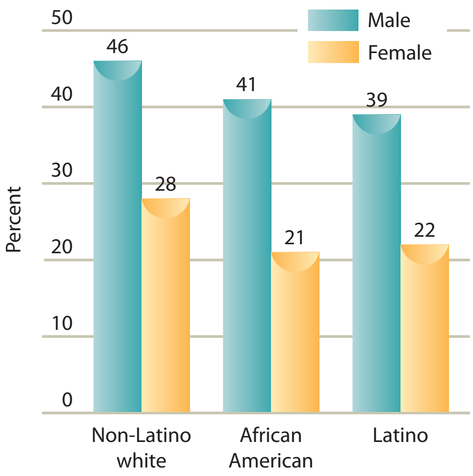


FIGURE **11.9**

EXERCISE RATES OF U.S. HIGH SCHOOL STUDENTS: GENDER AND ETHNICITY.

Note: Data are for high school students who were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes per day on five or more of the seven days preceding the survey.

Sleep Patterns Like nutrition and exercise, sleep is an important influence on well-being. Might changing sleep patterns in adolescence contribute to adolescents' health-compromising behaviors? Recently there has been a surge of interest in adolescent sleep patterns (Anderson & others, 2009; Brand & others, 2010; Mosseley & Gradisar, 2009; Wolfson, 2010).

In a national survey of youth, only 31 percent of U.S. adolescents got eight or more hours of sleep on an average school night (Eaton & others, 2008). In this study, the percentage of adolescents getting this much sleep on an average school night decreased as they got older (see Figure 11.10).

The National Sleep Foundation (2006) conducted a U.S. survey of 1,602 caregivers and their 11- to 17-year-olds. Forty-five percent of the adolescents got inadequate sleep on school nights (less than eight hours). Older adolescents (9th- to 12th-graders) got markedly less sleep on school nights than younger adolescents (6th- to 8th-graders)—62 percent of the older adolescents got inadequate sleep compared to 21 percent of the younger adolescents. Adolescents who got inadequate sleep (eight hours or less) on school nights were more likely to feel more

In Mary Carskadon's sleep laboratory at Brown University, an adolescent girl's brain activity is being monitored. Carskadon (2005) says that in the morning, sleep-deprived adolescents' "brains are telling them it's night time . . . and the rest of the world is saying it's time to go to school" (p. 19).

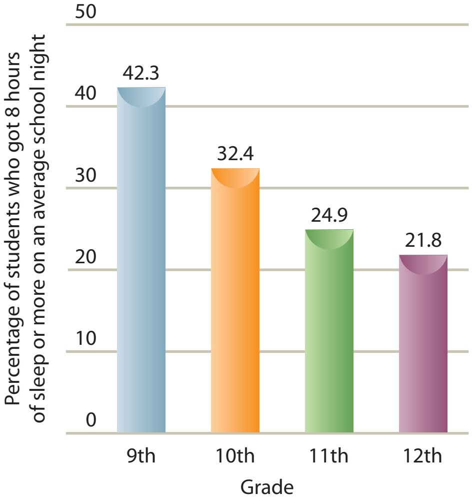


FIGURE **11.10**

DEVELOPMENTAL CHANGES IN U.S. ADOLESCENTS' SLEEP PATTERNS ON AN AVERAGE SCHOOL NIGHT

tired or sleepy, more cranky and irritable, fall asleep in school, be in a depressed mood, and drink caffeinated beverages than their counterparts who got optimal sleep (nine or more hours).

Mary Carskadon and her colleagues (2004, 2006; Jenni & Carskadon, 2007; Tarokh & Carskadon, 2008) have conducted a number of research studies on adolescent sleep patterns. They found that when given the opportunity adolescents will sleep an average of 9 hours and 25 minutes a night. Most get considerably less than nine hours of sleep, however, especially during the week. This shortfall creates a sleep deficit, which adolescents often attempt to make up on the weekend. The researchers also found that older adolescents tend to be sleepier during the day than younger adolescents. They theorized that this sleepiness was not due to academic work or social pressures. Rather, their research suggests that adolescents' biological clocks undergo a shift as they get older, delaying their period of sleepiness by about one hour. A delay in the nightly release of the sleep-inducing hormone melatonin, which is produced in the brain's pineal gland, seems to underlie this shift. Melatonin is secreted at about 9:30 p.m. in younger adolescents and approximately an hour later in older adolescents.

Carskadon concludes that early school starting times may cause grogginess, inattention in class, and poor performance on tests. Based on her research, school officials in Edina, Minnesota, decided to start classes at 8:30 a.m. rather than the usual 7:25 a.m. Since then there have been fewer referrals for discipline problems, and the number of students who report being ill or depressed has decreased. The school system reports that test scores have improved for high school students, but not for middle school students. This finding supports Carskadon's suspicion that early start times are likely to be more stressful for older than for younger adolescents.

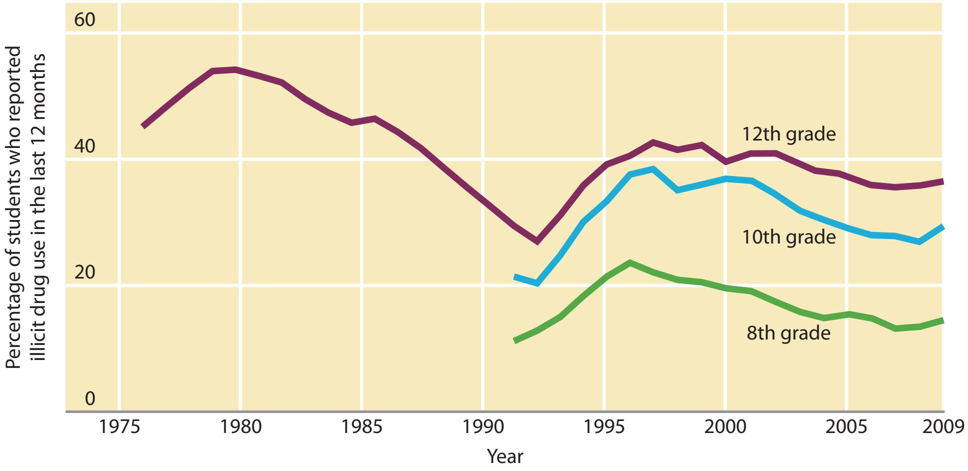
Leading Causes of Death in Adolescence The three leading causes of death in adolescence are accidents, homicide, and suicide (National Vital Statistics Reports, 2008). Almost half of all deaths from 15 to 24 years of age are due to unintentional injuries, approximately three-fourths of them involving motor vehicle accidents. Risky driving habits,

FOREVER
IN OUR
HEARTS

Students comfort each other in Canisteo, New York, at a memorial on the bridge where four adolescents from Jasper, New York were killed in a car crash in 2007.

FIGURE **11.11**

TRENDS IN DRUG USE BY U.S. 8TH-, 10TH-, AND 12TH-GRADE STUDENTS. This graph shows the percentage of U.S. 8th-, 10th-, and 12th-grade students who reported having taken an illicit drug in the last 12 months from 1991 to 2009, for 8th- and 10th-graders, and from 1975 to 2009, for 12th-graders (Johnston & others, 2010).



such as speeding, tailgating, and driving under the influence of alcohol or other drugs, may be more important contributors to these accidents than lack of driving experience (Dunlop & Romer, 2010; Shope, 2010). In about 50 percent of motor vehicle fatalities involving adolescents, the driver has a blood alcohol level of 0.10 percent—twice the level needed to be designated as "under the influence" in some states. A high rate of intoxication is also found in adolescents who die as pedestrians, or while using recreational vehicles.

Homicide is the second leading cause of death in adolescence (National Vital Statistics Reports, 2008), especially among African American males. Also notable is the adolescent suicide rate, which has tripled since the 1950s. Suicide accounts for 6 percent of the deaths in the 10 to 14 age group and 12 percent of deaths in the 15 to 19 age group. We will discuss suicide further in Chapter 12.

developmental **connection**

Substance Abuse. Does substance abuse increase or decrease in emerging adulthood? Chapter 13, p. 422

SUBSTANCE USE AND ABUSE

Each year since 1975, Lloyd Johnston and his colleagues at the Institute of Social Research at the University of Michigan have monitored the drug use of America's high school seniors in a wide range of public and private high schools. Since 1991, they also have surveyed drug use by 8th- and 10th-graders. In 2009, the study surveyed more than 45,000 secondary school students (Johnston & others, 2010).

According to this study, the proportions of 8th-, 10th-, and 12th-grade U.S. students who used any illicit drug declined in the late 1990s and the first decade of the 21st century (Johnston & others, 2010) (see Figure 11.11). Nonetheless, even with the recent decline in use, the United States still has one of the highest rates of adolescent drug use of any industrialized nation.

How extensive is alcohol use by U.S. adolescents? Sizeable declines in adolescence alcohol use have occurred in recent years (Johnston & others, 2010). The percentage of U.S. eighth-graders saying that they had any alcohol to drink in the past 30 days fell from a 1996 high of 26 percent to 15 percent in 2009. The 30-day prevalence fell among 10th-graders from 39 percent in 2001 to 28 percent in 2009 and among high school seniors from 72 percent in 1980 to 43 percent in 2009. Binge drinking (defined in the University of Michigan surveys as having five or more drinks in a row in the last two weeks) by high school seniors declined from 41 percent in 1980 to 27 percent in 2009. Binge drinking by 8th- and 10th-graders also has dropped in recent years. A consistent sex difference occurs in binge drinking, with males engaging in this activity more than females.

A special concern is when adolescents drink and drive. In the University of Michigan Monitoring the Future Study, 30 percent of high school seniors said they had been in a vehicle with a drugged or drinking driver in the past two weeks (Johnston & others, 2008).

What are some risk factors that predict whether adolescents will become regular smokers?

Cigarette smoking among U.S. adolescents peaked in 1996 and 1997 and has gradually declined since then (Johnston & others, 2010). Following peak use in 1996, smoking rates for U.S. eighth-graders have fallen by 50 percent. In 2008, the percentages of adolescents who said they smoked cigarettes in the last 30 days were 20 percent (12th grade), 12 percent (10th grade), and 7 percent (8th grade).

Smoking is likely to begin in grades 7 through 9, although sizeable portions of youth are still establishing regular smoking habits during high school and college. Risk factors for becoming a regular smoker in adolescence include having a friend who smoked, a weak academic orientation, and low parental support (Tucker, Ellickson, & Klein, 2003).

An alarming recent trend is use of prescription painkillers by adolescents. A 2004 survey revealed that 18 percent of U.S. adolescents had used Vicodin at some point in their lifetime, and 10 percent had used OxyContin (Partnership for a Drug-Free America, 2005). These drugs fall into the general class of drugs called narcotics, and they are highly addictive. In this national survey, 9 percent of adolescents said they had abused cough medications to intentionally get high. Adolescents cite the medicine cabinets of their parents or of friends' parents as the main source for their prescription painkillers (Johnston & others, 2008).

What are some factors that contribute to whether adolescents engage in substance abuse?

The Roles of Development, Parents, Peers, and Education A special concern involves adolescents who begin to use drugs early in adolescence or even in childhood (Patrick, Abar, & Maggs, 2009). A longitudinal study of individuals from 8 to 42 years of age also found that early onset of drinking was linked to increased risk of heavy drinking in middle age (Pitkänen, Lyrra, & Pulkkinen, 2005).

Parents play an important role in preventing adolescent drug abuse (Chassin, Hussong, & Beltran, 2009; Harakeh & others, 2010; Hoffman, 2009; Miller & Plant, 2010). Researchers have found that parental monitoring is linked with a lower incidence of problem behavior by adolescents, including substance abuse (Fletcher, Steinberg, & Williams-Wheeler, 2004; Tobler & Komro, 2010). A recent research review found that the more frequently adolescents were at dinner with their family, the more likely they were to have fewer adolescent problems, including being less likely to have substance abuse problems (Sen, 2010). Another study of more than 5,000 middle school students revealed that having friends in their school's social network and having fewer friends who use substances were related to a lower level of substance use (Ennett & others, 2006).

Educational success is also a strong buffer for the emergence of drug problems in adolescence. A recent analysis by Jerald Bachman and his colleagues (2008) revealed that early educational achievement considerably reduced the likelihood that adolescents would develop drug problems, including alcohol abuse, smoking, and abuse of various illicit drugs. But what can families do to educate themselves and their children and reduce adolescent drinking and smoking behavior? To find out, see *Connecting Through Research*.

EATING DISORDERS

Let's now examine two eating problems—anorexia nervosa and bulimia nervosa—that are far more common in adolescent girls than boys.

Anorexia Nervosa Although most U.S. girls have been on a diet at some point, slightly less than 1 percent ever develop anorexia nervosa. **Anorexia nervosa** is an eating disorder that involves the relentless pursuit of thinness through starvation.

anorexia nervosa An eating disorder that involves the relentless pursuit of thinness through starvation.

connecting through research

What Can Families Do to Reduce Drinking and Smoking in Young Adolescents?

Experimental studies have been conducted to determine if family programs can reduce drinking and smoking in young adolescents. In one recent experimental study, 1,326 families with 12- to 14-year-old adolescents living throughout the United States were interviewed (Bauman & others, 2002). After the baseline interviews, participants were randomly assigned either to go through the Family Matters program (experimental group) or not to experience the program (control group) (Bauman & others, 2002).

The families assigned to the Family Matters program received four mailings of booklets. Each mailing was followed by a telephone call from a health educator to "encourage participation by all family members, answer any questions, and record information" (Bauman & others, 2002, pp. 36–37). The first booklet focused on the negative consequences of adolescent substance abuse to the family. The second emphasized "supervision, support, communication skills, attachment, time spent together, educational achievement, conflict reduction, and how well adolescence is understood." The third booklet asked parents to "list things that they do that might inadvertently encourage their child's use of tobacco or alcohol, identify rules that might influence the child's use, and consider ways to monitor use. Then adult family members and the child meet to agree upon rules and sanctions related to adolescent use." Booklet four deals with what "the child can do to resist peer and media pressures for use."

Two follow-up interviews with the parents and adolescents were conducted three months and one year after the experimental group completed the program. Adolescents in the Family Matters program reported lower alcohol and cigarette use both at three months and again one year after the program had been completed. Figure 11.12 shows the results for alcohol.

The topics covered in the second booklet underscore the importance of parental influence earlier in development. For instance, staying actively involved and establishing an authoritative, as opposed to a neglectful, parenting style early in children's lives will better ensure that they have a clear understanding of the parents' level of support and expectations when the children reach adolescence.

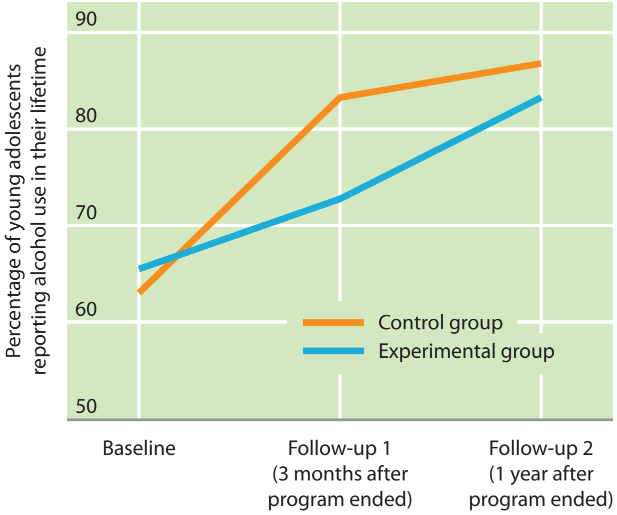


FIGURE **11.12**

YOUNG ADOLESCENTS' REPORTS OF ALCOHOL USE IN THE FAMILY MATTERS PROGRAM. Note that at baseline (before the program started) the young adolescents in the Family Matters program (experimental group) and their counterparts who did not go through the program (control group) reported approximately the same lifetime use of alcohol (slightly higher use by the experimental group). However, three months after the program ended, the experimental group reported lower alcohol use, and this reduction was still present one year after the program ended, although at a reduced level.

It is a serious disorder that can lead to death. Three main characteristics apply to people suffering from anorexia nervosa: (1) weight less than 85 percent of what is considered normal for their age and height; (2) an intense fear of gaining weight that does not decrease with weight loss; and (3) a distorted image of their body shape (Rigaud & others, 2007). Even when they are extremely thin, they see themselves as too fat. They never think they are thin enough, especially in the abdomen, buttocks, and thighs. They usually weigh themselves frequently, often take their body measurements, and gaze critically at themselves in mirrors.

Anorexia nervosa typically begins in the early to middle adolescent years, often following an episode of dieting and some type of life stress. It is about 10 times more likely to occur in females than males. When anorexia nervosa does occur in males, the symptoms and other characteristics (such as a distorted body image and family conflict) are usually similar to those reported by females who have the disorder (Ariceli & others, 2005).

Most anorexics are non-Latina White adolescent or young adult females from well-educated, middle- and upper-income families and are competitive and high-achieving (Schmidt, 2003). They set high standards, become stressed about not being able to reach the standards, and are intensely concerned about how others perceive them. Unable to meet these high expectations, they turn to something they can control: their weight. Offspring of mothers with anorexia nervosa are at risk for becoming anorexic themselves (Striegel-Moore & Bulik, 2007). Problems in family functioning are increasingly being found to be linked to the appearance of anorexia nervosa in adolescent girls (Benninghoven & others, 2007), and a recent research review indicated that family therapy is often the most effective treatment of adolescent girls with anorexia nervosa (Bulik & others, 2007).

The fashion image in U.S. culture contributes to the incidence of anorexia nervosa (Striegel-Moore & Bulik, 2007). The media portray thin as beautiful in their choice of fashion models, whom many adolescent girls strive to emulate. And many adolescent girls who strive to be thin hang out together.

Anorexia nervosa has become an increasing problem for adolescent girls and young adult women. *What are some possible causes of anorexia nervosa?*

Bulimia Nervosa Whereas anorexics control their eating by restricting it, most bulimics cannot. **Bulimia nervosa** is an eating disorder in which the individual consistently follows a binge-and-purge pattern. The bulimic goes on an eating binge and then purges by self-inducing vomiting or using a laxative. Although many people binge and purge occasionally and some experiment with it, a person is considered to have a serious bulimic disorder only if the episodes occur at least twice a week for three months (Napierski-Prancl, 2009).

As with anorexics, most bulimics are preoccupied with food, have a strong fear of becoming overweight, are depressed or anxious, and have a distorted body image. A recent study revealed that bulimics overvalued their body weight and shape, and this overvaluation was linked to higher depression and lower self-esteem (Hrabosky & others, 2007). Unlike anorexics, people who binge and purge typically fall within a normal weight range, which makes bulimia more difficult to detect.

Approximately 1 to 2 percent of U.S. women are estimated to develop bulimia nervosa, and about 90 percent of bulimics are women. Bulimia nervosa typically begins in late adolescence or early adulthood. Many women who develop bulimia nervosa were somewhat overweight before the onset of the disorder, and the binge eating often began during an episode of dieting. As with anorexia nervosa, about 70 percent of individuals who develop bulimia nervosa eventually recover from the disorder (Agras & others, 2004).

bulimia nervosa An eating disorder in which the individual consistently follows a binge-and-purge pattern.

Review *Connect* Reflect

LG3 Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Review

- What are key concerns about the health of adolescents?
- What are some characteristics of adolescents' substance use and abuse?
- What are the characteristics of the major eating disorders?

Connect

- In *Connecting Through Research*, you learned that attachment was one of the things that the Family Matters program emphasized as important in reducing drinking and smoking behavior in adolescents. Do the research findings you read in Chapter 6 support or contradict this emphasis on early attachment's affect on development and behavior later in life?

Reflect *Your Own Personal Journey of Life*

- How health-enhancing and health-compromising were your patterns of behavior in adolescence? Explain.

4 Adolescent Cognition

LG4 Explain cognitive changes in adolescence.

Piaget's Theory
Adolescent Egocentrism
Information Processing

WE ARE THE DROPS OF ONE OCEAN & THE LEAVES OF ONE TREE
MANKIND IS ONE FAMILY
ONE PLANET ONE PEOPLE PLEASE

Might adolescents' ability to reason hypothetically and to evaluate what is ideal versus what is real lead them to engage in demonstrations, such as this protest related to better ethnic relations? What other causes might be attractive to adolescents' newfound cognitive abilities of hypothetical-deductive reasoning and idealistic thinking?

Adolescents' developing power of thought opens up new cognitive and social horizons. Let's examine what their developing power of thought is like, beginning with Piaget's theory (1952).

PIAGET'S THEORY

As we discussed in Chapter 9, Piaget proposed that around 7 years of age children enter the *concrete operational stage* of cognitive development. They can reason logically about concrete events and objects, and they make gains in the ability to classify objects and to reason about the relationships between classes of objects. Around age 11, according to Piaget, the fourth and final stage of cognitive development, the formal operational stage, begins.

The Formal Operational Stage What are the characteristics of the formal operational stage? Formal operational thought is more abstract than concrete operational thought. Adolescents are no longer limited to actual, concrete experiences as anchors for thought. They can conjure up make-believe situations, abstract propositions, and events that are purely hypothetical, and can try to reason logically about them.

"Ben is in his first year of high school, and he's questioning all the right things."

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www.cartoonbank.com.

The abstract quality of thinking during the formal operational stage is evident in the adolescent's verbal problem-solving ability. Whereas the concrete operational thinker needs to see the concrete elements A, B, and C to be able to make the logical inference that if A = B and B = C, then A = C, the formal operational thinker can solve this problem merely through verbal presentation.

Another indication of the abstract quality of adolescents' thought is their increased tendency to think about thought itself. One adolescent commented, "I began thinking about why I was thinking what I was. Then I began thinking about why I was thinking about what I was thinking about what I was." If this sounds abstract, it is, and it characterizes the adolescent's enhanced focus on thought and its abstract qualities.

Accompanying the abstract nature of formal operational thought is thought full of idealism and possibilities, especially during the beginning of the formal operational stage, when assimilation dominates. Adolescents engage in extended speculation about ideal characteristics—qualities they desire in themselves and in others. Such thoughts often lead adolescents to compare themselves with others in regard to such ideal standards. And their thoughts are often fantasy flights into future possibilities.

At the same time that adolescents think more abstractly and idealistically, they also think more logically. Children are likely to solve problems through trial and error; adolescents begin to think more as a scientist thinks, devising plans to solve problems and systematically testing solutions. This type of problem solving requires **hypothetical-deductive reasoning,** which involves creating a hypothesis and deducing its implications, steps that provide ways to test the hypothesis. Thus, formal operational thinkers develop hypotheses about ways to solve problems and then systematically deduce the best path to follow to solve the problem.

developmental **connection**

Cognitive Theory. Is there a fifth, postformal stage of cognitive development that characterizes young adults? Chapter 13, p. 433

hypothetical-deductive reasoning Piaget's formal operational concept that adolescents have the cognitive ability to develop hypotheses, or best guesses, about ways to solve problems, such as an algebraic equation.

Evaluating Piaget's Theory Researchers have challenged some of Piaget's ideas on the formal operational stage (Byrnes, 2008). Among their findings is that there is much more individual variation than Piaget envisioned: Only about one in three young adolescents is a formal operational thinker, and many American adults never become formal operational thinkers; neither do many adults in other cultures.

Furthermore, education in the logic of science and mathematics promotes the development of formal operational thinking. This point recalls a criticism of Piaget's theory that we discussed in Chapter 9: Culture and education exert stronger influences on cognitive development than Piaget maintained (Holzman, 2009; Sternberg & Willliams, 2010).

Piaget's theory of cognitive development has been challenged on other points as well (Bauer, 2009). As we noted in Chapter 9, Piaget conceived of stages as unitary structures of thought, with various aspects of a stage emerging at the same time. However, most contemporary developmentalists agree that cognitive development is not as stage-like as Piaget thought (Kuhn, 2009). Furthermore, children can be trained to reason at a higher cognitive stage, and some cognitive abilities emerge earlier than Piaget thought (Aslin, 2009; Diamond, Casey, & Munakata, 2011; Spelke & Kinzler, 2009). Some understanding of the conservation of number has been demonstrated as early as age 3, although Piaget did not think it emerged until 7. Other cognitive abilities can emerge later than Piaget thought (Byrnes, 2008). As we just noted, many adolescents still think in concrete operational ways or are just beginning to master formal operations, and even many adults are not formal operational thinkers.

Despite these challenges to Piaget's ideas, we owe him a tremendous debt (Carpendale, Muller, & Bibok, 2008). Piaget was the founder of the present field of cognitive development, and he developed a long list of masterful concepts of enduring power and fascination: assimilation, accommodation, object permanence, egocentrism, conservation, and others. Psychologists also owe him the current vision of children as active, constructive thinkers. And they have a debt to him for creating a theory that generated a huge volume of research on children's cognitive development.

Piaget also was a genius when it came to observing children. His careful observations demonstrated inventive ways to discover how children act on and adapt to their world. He also showed us how children need to make their experiences fit their schemes yet simultaneously adapt their schemes to experience. Piaget also revealed how cognitive change is likely to occur if the context is structured to allow gradual movement to the next higher level. Concepts do not emerge suddenly, full-blown, but instead develop through a series of partial accomplishments that lead to increasingly comprehensive understanding.

developmental **connection**

Cognitive Theory. Piaget described a form of egocentrism that characterizes young children. Chapter 7, p. 221

ADOLESCENT EGOCENTRISM

Adolescent egocentrism is the heightened self-consciousness of adolescents. David Elkind (1976) points out that adolescent egocentrism has two key components—the imaginary audience and personal fable. The **imaginary audience** is adolescents' belief that others are as interested in them as they themselves are, as well as attention-getting behavior—attempts to be noticed, visible, and "on stage." For example, an eighth-grade boy might walk into the classroom and think that all eyes are riveted on his spotty complexion. Adolescents sense that they are "on stage" in early adolescence, believing they are the main actors and all others are the audience.

According to Elkind, the **personal fable** is the part of adolescent egocentrism involving a sense of uniqueness and invincibility (or invulnerability). For example, 13-year-old Adrienne says this about herself: "No one understands me, particularly my parents. They have no idea of what I am feeling." Adolescents' sense of personal uniqueness makes them feel that no one can understand how they really feel. As part of their effort to retain a sense of personal uniqueness, adolescents might craft a story about the self that is filled with fantasy, immersing themselves in a world that is far removed from reality. Personal fables frequently show up in adolescent diaries.

> In youth, we clothe ourselves with rainbows, and go brave as the zodiac.
>
> —RALPH WALDO EMERSON
>
> *American Poet, 19th Century*

adolescent egocentrism The heightened self-consciousness of adolescents.

imaginary audience Involves adolescents' belief that others are as interested in them as they themselves are, as well as attention-getting behavior motivated by a desire to be noticed, visible, and "on stage."

personal fable The part of adolescent egocentrism that involves an adolescent's sense of uniqueness and invincibility (or invulnerability).

Many adolescent girls spend long hours in front of the mirror, depleting cans of hairspray, tubes of lipstick, and jars of cosmetics. *How might this behavior be related to changes in adolescent cognitive and physical development?*

Adolescents also often show a sense of invincibility or invulnerability. For example, during a conversation with a girl her same age, 14-year-old Margaret says, "Are you kidding? I won't get pregnant." This sense of invincibility may also lead adolescents to believe that they themselves are invulnerable to dangers and catastrophes (such as deadly car wrecks) that happen to other people. As a result, some adolescents engage in risky behaviors such as drag racing, drug use, suicide, and having sexual intercourse without using contraceptives or barriers against STIs (Alberts, Elkind, & Ginsberg, 2007). However, some research studies suggest that rather than perceiving themselves to be invulnerable, adolescents tend to portray themselves as vulnerable to experiencing a premature death (Bruine de Bruin, Parker, & Fischhoff, 2007; Fischhoff & others, 2010; Reyna & Rivers, 2008).

INFORMATION PROCESSING

Deanna Kuhn (2009) recently discussed some important characteristics of adolescents' information processing and thinking. In her view, in the later years of childhood and continuing in adolescence, individuals approach cognitive levels that may or may not be achieved, in contrast to the largely universal cognitive levels that young children attain. By adolescence, considerable variation in cognitive functioning is present across individuals. This variability supports the argument that adolescents are producers of their own development to a greater extent than are children.

According Kuhn (2009), the most important cognitive change in adolescence is improvement in *executive functioning*, which involves higher-order cognitive activities such as reasoning, making decisions, monitoring thinking critically, and monitoring one's cognitive progress. Improvements in executive functioning permit more effective learning and an improved ability to determine how attention will be allocated, to make decisions, and to engage in critical thinking.

Decision Making Adolescence is a time of increased decision making—which friends to choose; which person to date; whether to have sex, buy a car, go to college, and so on (Sunstein, 2008). How competent are adolescents at making decisions? Older adolescents are described as more competent than younger adolescents, who in turn are more competent than children (Keating, 1990). Compared with children, young adolescents are more likely to generate different options, examine a situation from a variety of perspectives, anticipate the consequences of decisions, and consider the credibility of sources.

Most people make better decisions when they are calm rather than emotionally aroused. That may especially be true for adolescents, who have a tendency to be emotionally intense. The same adolescent who makes a wise decision when calm may make an unwise decision when emotionally aroused (Paus, 2009; Steinberg, 2008). In the heat of the moment, emotions may overwhelm decision-making ability.

The social context plays a key role in adolescent decision making. For example, adolescents' willingness to make risky decisions is more likely to occur in contexts where substances and other temptations are readily available (Reyna & Rivers, 2008). Recent research reveals that the presence of peers in risk-taking situations increases the likelihood that adolescents will make risky decisions (Steinberg, 2008).

One proposal to explain adolescent decision making is the **dual-process model,** which states that decision making is influenced by two cognitive systems—one analytical and one experiential—which compete with each other (Klacyznski, 2001; Reyna & Farley, 2006). The dual-process model emphasizes that it is the experiential system—monitoring and managing actual experiences—that benefits adolescents' decision making, not the analytical system. In this view, adolescents don't benefit from engaging in reflective, detailed, higher-level cognitive analysis about a decision, especially in high-risk, real-world contexts. In such contexts, adolescents just need to know that there are some circumstances that are so dangerous that they need to be avoided at all costs (Mills, Reyna, & Estrada, 2008). However, some

dual-process model States that decision making is influenced by two systems—one analytical and one experiential, which compete with each other; in this model, it is the experiential system—monitoring and managing actual experiences—that benefits adolescent decision making.

experts on adolescent cognition argue that in many cases adolescents benefit from both analytical and experiential systems (Kuhn, 2009).

Adolescents need more opportunities to practice and discuss realistic decision making. Many real-world decisions on matters such as sex, drugs, and daredevil driving occur in an atmosphere of stress that includes time constraints and emotional involvement. One strategy for improving adolescent decision making is to provide more opportunities for them to engage in role playing and peer group problem solving.

Critical Thinking Adolescence is an important transitional period in the development of critical thinking (Keating, 1990). In one study of 5th-, 8th-, and 11th-graders, critical thinking increased with age but still occurred in only 43 percent of even the 11th-graders, and many adolescents showed self-serving biases in their reasoning.

If fundamental skills (such as literacy and math skills) are not developed during childhood, critical-thinking skills are unlikely to mature in adolescence. For the subset of adolescents who lack such fundamental skills, potential gains in adolescent thinking are unlikely. For other adolescents, however, cognitive changes that allow improved critical thinking in adolescence include the following: (1) increased speed, automaticity, and capacity of information processing, which free cognitive resources for other purposes; (2) more breadth of content knowledge in a variety of domains; (3) increased ability to construct new combinations of knowledge; and (4) a greater range and more spontaneous use of strategies or procedures for applying or obtaining knowledge, such as planning, considering alternatives, and cognitive monitoring.

Review *Connect* Reflect

LG4 Explain cognitive changes in adolescence.

Review

- What is Piaget's theory of adolescent cognitive development?
- What is adolescent egocentrism?
- What are some important aspects of information processing in adolescence?

Connect

- Egocentrism was also mentioned in Chapter 7 in the context of early childhood cognitive development. How is egocentrism similar or different in early childhood and adolescence?

Reflect *Your Own Personal Journey of Life*

- Evaluate the level of your thinking as you made the transition to adolescence and through adolescence. Does Piaget's stage of formal operational thinking accurately describe the changes that occurred in your thinking? Explain.

5 Schools

LG5 Summarize some key aspects of how schools influence adolescent development.

- The Transition to Middle or Junior High School
- Effective Schools for Young Adolescents
- High School
- Extracurricular Activities
- Service Learning

What is the transition from elementary to middle or junior high school like? What are the characteristics of effective schools for adolescents? How can adolescents benefit from service learning?

THE TRANSITION TO MIDDLE OR JUNIOR HIGH SCHOOL

The first year of middle school or junior high school can be difficult for many students (Anderman & Anderman, 2010; Elmore, 2009). For example, in one study of the transition from sixth grade in an elementary school to the seventh grade in a junior high school, adolescents' perceptions of the quality of their school life plunged in the seventh grade (Hirsch & Rapkin, 1987). Compared with their earlier feelings as sixth-graders, the seventh-graders were less satisfied with school, were less committed to school, and liked their teachers less. The drop in school satisfaction occurred regardless of how academically successful the students were. The transition to middle or junior high school is less stressful when students have positive relationships with friends and go through the transition in team-oriented schools that have 20 to 30 students take the same classes together (Hawkins & Berndt, 1985).

The transition from elementary to middle or junior high school occurs at the same time as a number of other developmental changes. *What are some of these other developmental changes?*

The transition to middle or junior high school takes place at a time when many changes—in the individual, in the family, and in school—are occurring simultaneously. These changes include puberty and related concerns about body image; the emergence of at least some aspects of formal operational thought, including accompanying changes in social cognition; increased responsibility and decreased dependency on parents; change to a larger, more impersonal school structure; change from one teacher to many teachers and from a small, homogeneous set of peers to a larger, more heterogeneous set of peers; and an increased focus on achievement and performance. Moreover, when students make the transition to middle or junior high school, they experience the **top-dog phenomenon,** moving from being the oldest, biggest, and most powerful students in the elementary school to being the youngest, smallest, and least powerful students in the middle or junior high school.

There can also be positive aspects to the transition to middle or junior high school. Students are more likely to feel grown up, have more subjects from which to select, have more opportunities to spend time with peers and locate compatible friends, and enjoy increased independence from direct parental monitoring. They also may be more challenged intellectually by academic work.

EFFECTIVE SCHOOLS FOR YOUNG ADOLESCENTS

Critics argue that middle and junior high schools should offer activities that reflect a wide range of individual differences in biological and psychological development among young adolescents. In 1989 the Carnegie Corporation issued an extremely negative evaluation of our nation's middle schools. It concluded that most young adolescents attended massive, impersonal schools; were taught from irrelevant curricula; trusted few adults in school; and lacked access to health care and counseling. It recommended that the nation should develop smaller "communities" or "houses" to lessen the impersonal nature of large middle schools, have lower student-to-counselor ratios (10 to 1 instead of several hundred to 1), involve parents and community leaders in schools, develop new curricula, have teachers team teach in more flexibly designed curriculum blocks that integrate several disciplines, boost students' health and fitness with more in-school programs, and help students who need public health care to get it. Twenty years later, experts are still finding that middle schools throughout the nation need a major redesign if they are to be effective in educating adolescents (Eccles & Roeser, 2009; Elmore, 2009).

top-dog phenomenon The circumstance of moving from the top position in elementary school to the lowest position in middle or junior high school.

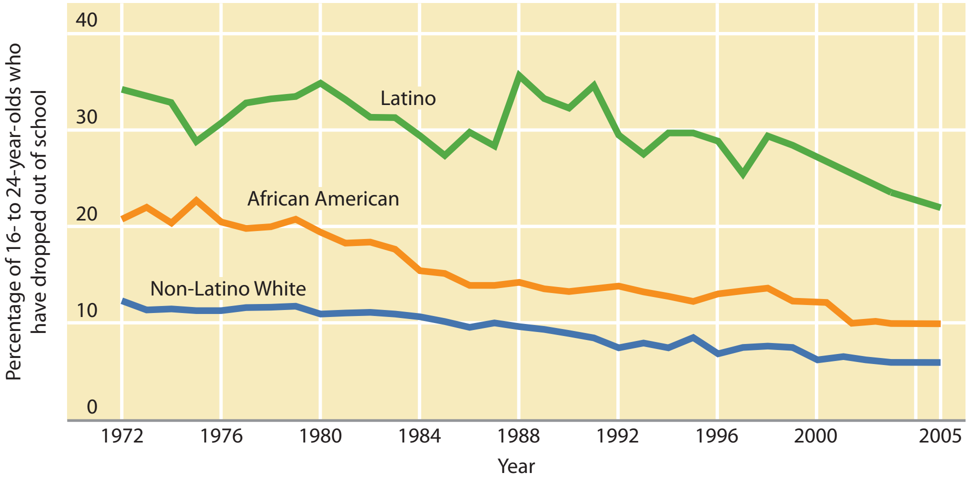

FIGURE **11.13**

TRENDS IN HIGH SCHOOL DROPOUT RATES. From 1972 through 2005, the school dropout rate for Latinos remained very high (22 percent of 16- to 24-year-olds in 2005). The African American dropout rate was still higher (10 percent) than the White non-Latino rate (6 percent) in 2005. (*Source:* National Center for Education Statistics, 2007.)

HIGH SCHOOL

Just as there are concerns about U.S. middle school education, so are there concerns about U.S. high school education (Smith, 2009). Critics stress that in many high schools expectations for success and standards for learning are too low. Critics also argue that too often high schools foster passivity and that schools should create a variety of pathways for students to achieve an identity. Many students graduate from high school with inadequate reading, writing, and mathematical skills—including many who go on to college and have to enroll in remediation classes there. Other students drop out of high school and do not have skills that will allow them to obtain decent jobs, much less to be informed citizens.

In the last half of the 20th century and the first several years of the 21st century, U.S. high school dropout rates declined (National Center for Education Statistics, 2008b) (see Figure 11.13). In the 1940s, more than half of U.S. 16- to 24-year-olds had dropped out of school; by 2006 this figure had decreased to 9.3 percent. The dropout rate of Latino adolescents remains high, although it has been decreasing in the 21st century (from 28 percent in 2000 to 22 percent in 2006). The highest dropout rate in the United States, though, likely occurs for Native American youth—less than 50 percent finish their high school education.

Students drop out of school for many reasons (Jimerson, 2009). In one study, almost 50 percent of the dropouts cited school-related reasons for leaving school, such as not liking school or being expelled or suspended (Rumberger, 1983). Twenty percent of the dropouts (but 40 percent of the Latino students) cited economic reasons for leaving school. One-third of the female students dropped out for personal reasons such as pregnancy or marriage.

According to a research review, the most effective programs to discourage dropping out of high school provide early reading programs, tutoring, counseling, and mentoring (Lehr & others, 2003). Clearly, then, early detection of children's school-related difficulties and getting children engaged with school in positive ways are important strategies for reducing the dropout rate.

Also, recently the Bill and Melinda Gates Foundation (2008) funded efforts to reduce the dropout rate in schools where dropout rates are high. One strategy that is being emphasized in the Gates' funding is keeping students at risk for dropping out of school with the same teachers through their high school years. The hope is that the teachers will get to know these students much better, their relationship with the students will improve, and they will be able to monitor and guide the students toward graduating from high school.

One program that has been very effective in reducing school dropout rates is "I Have a Dream" (IHAD), an innovative comprehensive, long-term

These adolescents are participating in the "I Have a Dream" (IHAD) Program, a comprehensive, long-term dropout prevention program that has been very successful. *What are some other strategies for reducing high school dropout rates?*

dropout prevention program administered by the National "I Have a Dream" Foundation in New York. Local IHAD projects around the country "adopt" entire grades (usually the third or fourth) from public elementary schools, or corresponding age cohorts from public housing developments. These children—"Dreamers"—are then provided with a program of academic, social, cultural, and recreational activities throughout their elementary, middle school, and high school years.

Evaluations of IHAD programs have found dramatic improvements in grades, test scores, and school attendance, as well as a reduction of behavioral problems of Dreamers. For example, in Portland, Oregon, twice as many Dreamers as control-group students had reached a math standard, and the Dreamers were less likely to be referred to the juvenile justice system (Davis, Hyatt, & Arrasmith, 1998).

EXTRACURRICULAR ACTIVITIES

Adolescents in U.S. schools usually have a wide array of extracurricular activities they can participate in beyond their academic courses. These adult-sanctioned activities typically occur in the after-school hours and can be sponsored either by the school or by the community. They include such diverse activities as sports, academic clubs, band, drama, and math clubs. Researchers have found that participation in extracurricular activities is linked to higher grades, school engagement, less likelihood of dropping out of school, improved probability of going to college, higher self-esteem, and lower rates of depression, delinquency, and substance abuse (Fredricks & Eccles, 2010; Mahoney & others, 2009; Parente & Mahoney, 2009). Adolescents gain more benefit from a breadth of extracurricular activities than from a focus on a single extracurricular activity.

Of course, the quality of the extracurricular activities matters (Mahoney & others, 2009; Parente & Mahoney, 2009). High-quality extracurricular activities that are likely to promote positive adolescent development include competent, supportive adult mentors, opportunities for increasing school connectedness, challenging and meaningful activities, and opportunities for improving skills.

SERVICE LEARNING

Service learning is a form of education that promotes social responsibility and service to the community. In service learning, adolescents engage in activities such as tutoring, helping older adults, working in a hospital, assisting at a child-care center, or cleaning up a vacant lot to make a play area. An important goal of service learning is that adolescents become less self-centered and more strongly motivated to help others (Sherrod & Lauckhardt, 2009). Service learning is often more effective when two conditions are met (Nucci, 2006): (1) giving students some degree of choice in the service activities in which they participate, and (2) providing students opportunities to reflect about their participation.

Service learning takes education out into the community (Sherrod & Lauckhardt, 2009). One 11th-grade student worked as a reading tutor for students from low-income backgrounds with reading skills well below their grade levels. She commented that until she did the tutoring, she did not realize how many students had not experienced the same opportunities that she had when she was growing up. An especially rewarding moment was when one young girl told her, "I want to learn to read like you so I can go to college when I grow up." Thus, a key feature of service learning is that it benefits not only adolescents but also the recipients of their help.

What are some of the positive effects of service learning?

service learning A form of education that promotes social responsibility and service to the community.

Researchers have found that service learning benefits adolescents in a number of ways (Sherrod & Lauckhardt, 2009). Improvements in adolescent development related to service learning include higher grades in school, increased goal setting, higher self-esteem, an improved sense of being able to make a difference for others, and an increased likelihood that the adolescents will serve as volunteers in the future (Hart, Matsuba, & Atkins, 2008). A recent study found that adolescent girls participated in service learning more than did adolescent boys (Webster & Worrell, 2008).

developmental **connection**

Gender. Females are more likely to engage in prosocial behavior than males. Chapter 10, p. 323

Review *Connect* Reflect

LG5 Summarize some key aspects of how schools influence adolescent development.

Review

- What is the transition to middle or junior high school like?
- What are some characteristics of effective schools for young adolescents?
- What are some important things to know about high school dropouts and improving high schools?
- How does participation in extracurricular activities influence adolescent development?
- What is service learning, and how does it affect adolescent development?

Connect

- Compare the optimal school learning environments for adolescents described in this chapter to those described for younger children in previous chapters. Aside from age-appropriate curricula, what else is similar or different?

Reflect *Your Own Personal Journey of Life*

- What was your middle or junior high school like? How did it measure up to the Carnegie Corporation's recommendations?

topical **connections**

From 18 to 25 years of age, individuals make a transition from adolescence to adulthood. This transitional period is called emerging adulthood and it is characterized by identity exploration, instability, and possibilities. Individuals often reach the peak of their physical skills from about 19 to 26 years of age, but declines in physical development typically occur in the early 30s. Cognitive development becomes more pragmatic and realistic, as well as more reflective and relativistic. Work becomes a more central aspect of individuals' lives.

looking ***forward***

reach your **learning goals**

Physical and Cognitive Development in Adolescence

1 The Nature of Adolescence

LG1 Discuss the nature of adolescence.

- Many stereotypes of adolescents are too negative. Most adolescents today successfully negotiate the path from childhood to adulthood. However, too many of today's adolescents are not provided with adequate opportunities and support to become competent adults. It is important to view adolescents as a heterogeneous group because different portraits of adolescents emerge, depending on the particular set of adolescents being described.

2 Physical Changes

LG2 Describe the changes involved in puberty as well as changes in the brain and sexuality during adolescence.

Puberty

- Puberty is a period of rapid physical maturation involving hormonal and bodily changes that occurs primarily during early adolescence. Puberty's determinants include nutrition, health, and heredity. The initial onset of the pubertal growth spurt occurs on the average at 9 years for girls and 11 for boys, reaching a peak change for girls at 11½ and for boys at 13½. Individual variation in pubertal changes is substantial. Adolescents show considerable interest in their body image, with girls having more negative body images than boys do. For boys, early maturation brings benefits, at least during early adolescence. Early-maturing girls are vulnerable to a number of risks.

The Brain

- Changes in the brain during adolescence involve the thickening of the corpus callosum and a gap in maturation between the amygdala and the prefrontal cortex, which functions in reasoning and self-regulation.

Adolescent Sexuality

- Adolescence is a time of sexual exploration and sexual experimentation. Having sexual intercourse in early adolescence is associated with negative developmental outcomes. Contraceptive use by adolescents is increasing. About one in four sexually experienced adolescents acquires a sexually transmitted infection (STI). America's adolescent pregnancy rate is high but has been decreasing in recent years.

3 Issues in Adolescent Health

LG3 Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Adolescent Health

- Adolescence is a critical juncture in health because many of the factors related to poor health habits and early death in the adult years begin during adolescence. Poor nutrition, lack of exercise, and inadequate sleep are concerns. The three leading causes of death in adolescence are accidents, homicide, and suicide.

Substance Use and Abuse

- Despite recent declines in use, the United States has one of the highest rates of adolescent illicit drug use of any industrialized nation. Alcohol abuse is a major adolescent problem, although its rate has been dropping in recent years, as has cigarette smoking. A recent concern is the increased use of prescription painkillers by adolescents. Parents, peers, social support, and educational success play important roles in whether adolescents take drugs.

Eating Disorders

- Eating disorders have increased in adolescence with a substantial increase in the percentage of adolescents who are overweight. Two eating disorders that may emerge in adolescence are anorexia nervosa and bulimia nervosa. Anorexia nervosa typically starts in the early to middle adolescent years, following a dieting episode, and involves the relentless pursuit of thinness through starvation. Bulimia nervosa involves a binge-and-purge pattern, but—unlike anorexics—bulimics typically fall within a normal weight range.

4 Adolescent Cognition

LG4 Explain cognitive changes in adolescence.

Piaget's Theory	• During the formal operational stage, Piaget's fourth stage of cognitive development, thought is more abstract, idealistic, and logical than during the concrete operational stage. However, many adolescents are not formal operational thinkers but are consolidating their concrete operational thought.
Adolescent Egocentrism	• Elkind describes adolescent egocentrism as the heightened self-consciousness of adolescents that consists of two parts: the imaginary audience and the personal fable. Recent research questions whether adolescents perceive themselves to be invulnerable.
Information Processing	• Changes in information processing in adolescence are mainly reflected in improved executive functioning, which includes advances in decision making and critical thinking.

5 Schools

LG5 Summarize some key aspects of how schools influence adolescent development.

The Transition to Middle or Junior High School	• The transition to middle or junior high school coincides with many social, familial, and individual changes in the adolescent's life, and this transition is often stressful. One source of stress is the move from the top-dog position to the lowest position in school.
Effective Schools for Young Adolescents	• Some critics argue that a major redesign of U.S. middle schools is needed. Critics say that U.S. high schools foster passivity and do not develop students' academic skills adequately. Characteristics of effective schools include having lower student-to-counselor ratios, involving parents and community leaders in schools, using team teaching, and boosting students' health and fitness.
High School	• A number of strategies have been proposed for improving U.S. high schools, including higher expectations and better support. The overall high school dropout rate declined considerably in the last half of the 20th century, but the dropout rates of Latino and Native American youth remain very high.
Extracurricular Activities	• Participation in extracurricular activities is associated with positive academic and psychological outcomes. Adolescents benefit from participating in a variety of extracurricular activities; the quality of the activities also matter.
Service Learning	• Service learning, a form of education that promotes social responsibility and service to the community, is related to a number of positive benefits for adolescents such as higher grades, increased goal setting, and improved self-esteem.

key terms

puberty 353
menarche 354
hormones 354
precocious puberty 355
corpus callosum 357
amygdala 357
sexually transmitted infections (STIs) 361
anorexia nervosa 367
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chapter 12

SOCIOEMOTIONAL DEVELOPMENT IN ADOLESCENCE

chapter **outline**

1 The Self, Identity, and Religious/Spiritual Development

Learning Goal 1 Discuss self, identity, and religious/spiritual development in adolescence.

Self-Esteem
Identity
Religious and Spiritual Development

2 Families

Learning Goal 2 Describe changes that take place in adolescents' relationships with their parents.

Parental Monitoring
Autonomy and Attachment
Parent-Adolescent Conflict

3 Peers

Learning Goal 3 Characterize the changes that occur in peer relationships during adolescence.

Friendships
Peer Groups
Dating and Romantic Relationships

4 Culture and Adolescent Development

Learning Goal 4 Explain how culture influences adolescent development.

Cross-Cultural Comparisons
Ethnicity
The Media

5 Adolescent Problems

Learning Goal 5 Identify adolescent problems in socioemotional development and strategies for helping adolescents with problems.

Juvenile Delinquency
Depression and Suicide
The Interrelation of Problems and Successful Prevention/Intervention Programs

The mayor of the city says she is "everywhere." She recently persuaded the city's school committee to consider ending the practice of locking tardy students out of their classrooms. She also swayed a neighborhood group to support her proposal for a winter jobs program. According to one city councilman, "People are just impressed with the power of her arguments and the sophistication of the argument" (Silva, 2005, pp. B1, B4). She is Jewel E. Cash, and she is only 16 years old.

A junior at Boston Latin Academy, Jewel was raised in one of Boston's housing projects by her mother, a single parent. Today she is a member of the Boston Student Advisory Council, mentors children, volunteers at a women's shelter, manages and dances in two troupes, and is a member of a neighborhood watch group—among other activities. Jewel is far from typical, but her activities illustrate that cognitive and socioemotional development allows even adolescents to be capable, effective individuals.

Jewel Cash seated next to her mother participating in a crime watch meeting at a community center.

topical **connections**

In middle and late childhood, development of self-understanding and understanding others becomes more sophisticated, emotional understanding improves, and moral reasoning advances. In Erikson's view, children now are in the industry versus inferiority stage with their industry reflected in an interest in building things and figuring out how things work. Children now spend more time with peers, but parents continue to play important roles in their development, especially in guiding their academic achievement and managing their opportunities. Peer status and friendship become more important in children's peer relations and school takes on a stronger academic focus.

looking ***back***

preview

Significant changes characterize socioemotional development in adolescence. These changes include increased efforts to understand one's self and searching for an identity. Changes also occur in the social contexts of adolescents' lives, with transformations occurring in relationships with families and peers in cultural contexts. Adolescents also may develop socioemotional problems, such as delinquency and depression.

1 The Self, Identity, and Religious/Spiritual Development

LG1 Discuss self, identity, and religious/spiritual development in adolescence.

Self-Esteem

Identity

Religious and Spiritual Development

Jewel Cash told an interviewer from the *Boston Globe,* "I see a problem and I say, 'How can I make a difference?'. . . I can't take on the world, even though I can try. . . . I'm moving forward but I want to make sure I'm bringing people with me." (Silva, 2005, pp. B1, B4). Jewel's confidence and positive identity sound at least as impressive as her activities. This section examines how adolescents develop characteristics like these. How much did you understand yourself during adolescence, and how did you acquire the stamp of your identity? Is your identity still developing?

SELF-ESTEEM

Recall from Chapter 10 that *self-esteem* is the overall way we evaluate ourselves. Controversy characterizes the extent to which self-esteem changes during adolescence and whether there are gender differences in adolescents' self-esteem (Harter, 2006). In one study, both boys and girls had particularly high self-esteem in childhood, but their self-esteem dropped considerably during adolescence (Robins & others, 2002). The self-esteem of girls declined more than the self-esteem of boys during adolescence in this study.

Does self-esteem in adolescence foreshadow adjustment and competence in adulthood? A New Zealand longitudinal study assessed the self-esteem of adolescents at 11, 13, and 15 years of age and adjustment and competence of the same individuals when they were 26 years old (Trzesniewski & others, 2006). The results revealed that adults characterized by poorer mental and physical health, worse economic prospects, and higher levels of criminal behavior were more likely to have low self-esteem in adolescence than their better adjusted, more competent adult counterparts.

Some critics argue that developmental changes and gender differences in self-esteem during adolescence have been exaggerated (Harter, 2006). Despite the differing results and interpretations, the self-esteem of girls is likely to decline at least somewhat during early adolescence.

Why would the self-esteem of girls decline during early adolescence? One explanation points to girls' negative body images during pubertal change. Another explanation involves the greater interest young adolescent girls take in social relationships and society's failure to reward that interest (Impett & others, 2008).

Self-esteem reflects perceptions that do not always match reality (Krueger, Vohs, & Baumeister, 2008). An adolescent's self-esteem might indicate a perception about whether he or she is intelligent and attractive, for example, but that perception may not be accurate. Thus, high self-esteem may refer to accurate, justified perceptions of one's worth as a person and one's successes and accomplishments, but it can also indicate an arrogant, grandiose, unwarranted sense of superiority over others. In the same manner, low self-esteem may suggest either an accurate perception of one's shortcomings or a distorted, even pathological insecurity and inferiority.

Narcissism refers to a self-centered and self-concerned approach toward others. Typically, narcissists are unaware of their actual self and how others perceive them. This lack of awareness contributes to their adjustment problems. Narcissists are excessively self-centered and self-congratulatory, viewing their own needs and desires as paramount.

Are today's adolescents and emerging adults more self-centered and narcissistic than their counterparts in earlier generations? Research by Jean Twenge & her colleagues (2008a, b) indicated that compared with Baby Boomers who were surveyed in 1975, 12th graders surveyed in 2006 were more self-satisfied overall and far more confident they would be very good employees, mates, and parents. However, another recent large-scale analysis revealed no increase in high school and college students' narcissism from the 1980s through 2007 (Trzesniewski, Donnellan, & Robins, 2008a, b). In sum, the extent to which recent generations of adolescents have higher self-esteem and are more narcissistic than earlier generations is controversial.

What characterizes narcissistic adolescents? Are today's adolescents more narcissistic than their counterparts in earlier generations?

IDENTITY

Who am I? What am I all about? What am I going to do with my life? What is different about me? How can I make it on my own? These questions reflect the search for an identity. By far the most comprehensive and provocative theory of identity development is Erik Erikson's. In this section, we examine his views on identity. We also discuss contemporary research on how identity develops and how social contexts influence that development.

What Is Identity? Identity is a self-portrait composed of many pieces, including these:

- The career and work path the person wants to follow (vocational/career identity)
- Whether the person is conservative, liberal, or middle-of-the-road (political identity)
- The person's spiritual beliefs (religious identity)
- Whether the person is single, married, divorced, and so on (relationship identity)
- The extent to which the person is motivated to achieve and is intellectual (achievement, intellectual identity)
- Whether the person is heterosexual, homosexual, or bisexual (sexual identity)
- Which part of the world or country a person is from and how intensely the person identifies with his or her cultural heritage (cultural/ethnic identity)
- The kind of things a person likes to do, which can include sports, music, hobbies, and so on (interests)
- The individual's personality characteristics, such as being introverted or extroverted, anxious or calm, friendly or hostile, and so on (personality)
- The individual's body image (physical identity)

Synthesizing the identity components can be a long and drawn-out process, with many negations and affirmations of various roles and faces. Identity development gets done in bits and pieces. Decisions are not made once and for all, but have to be made again and again. Identity development does not happen neatly, and it does not happen cataclysmically (Cote, 2009).

Erikson's View It was Erik Erikson (1950, 1968) who first understood how central questions about identity are to understanding adolescent development.

narcissism A self-centered and self-concerned approach toward others.

developmental **connection**

Cognitive Theory. Erikson's stage for middle and late childhood is industry versus inferiority and for early adulthood is intimacy versus isolation. Chapter 10, p. 317; Chapter 14, p. 452

> "Who are you?" said the Caterpillar. Alice replied, rather shyly, "I–I hardly know, Sir, just at present—at least I know who I was when I got up this morning, but I must have changed several times since then."
>
> —Lewis Carroll
>
> *English Writer, 19th Century*

Recall from Chapter 1 that Erikson's fifth developmental stage, which individuals experience during adolescence, is *identity versus identity confusion.* During this time, said Erikson, adolescents are faced with deciding who they are, what they are all about, and where they are going in life.

The search for an identity during adolescence is aided by a *psychosocial moratorium,* which is Erikson's term for the gap between childhood security and adult autonomy. During this period, society leaves adolescents relatively free of responsibilities and free to try out different identities. Adolescents experiment with different roles and personalities. They may want to pursue one career one month (lawyer, for example) and another career the next month (doctor, actor, teacher, social worker, or astronaut, for example). They may dress neatly one day, sloppily the next. This experimentation is a deliberate effort on the part of adolescents to find out where they fit in the world. Most adolescents eventually discard undesirable roles.

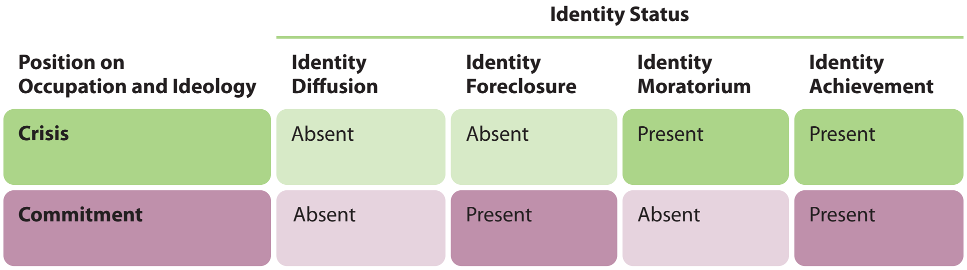
Youth who successfully cope with conflicting identities emerge with a new sense of self that is both refreshing and acceptable. Adolescents who do not successfully resolve this identity crisis suffer what Erikson calls identity confusion. The confusion takes one of two courses: Individuals withdraw, isolating themselves from peers and family, or they immerse themselves in the world of peers and lose their identity in the crowd.

Developmental Changes Although questions about identity may be especially important during adolescence, identity formation neither begins nor ends during these years. What is important about identity development in adolescence, especially late adolescence, is that for the first time, physical development, cognitive development, and socioemotional development advance to the point at which the individual can sort through and synthesize childhood identities and identifications to construct a viable path toward adult maturity.

How do individual adolescents go about the process of forming an identity? Eriksonian researcher James Marcia (1980, 1994) reasons that Erikson's theory of identity development contains four *statuses* of identity, or ways of resolving the identity crisis: identity diffusion, identity foreclosure, identity moratorium, and identity achievement. What determines an individual's identity status? Marcia classifies individuals based on the existence or extent of their crisis or commitment (see Figure 12.1). **Crisis** is defined as a period of identity development during which the individual is exploring alternatives. Most researchers use the term *exploration* rather than crisis. **Commitment** is personal investment in identity.

The four statuses of identity are:

- **Identity diffusion,** the status of individuals who have not yet experienced a crisis or made any commitments. Not only are they undecided about occupational and ideological choices, they are also likely to show little interest in such matters.



	Identity Status			
Position on Occupation and Ideology	**Identity Diffusion**	**Identity Foreclosure**	**Identity Moratorium**	**Identity Achievement**
Crisis	Absent	Absent	Present	Present
Commitment	Absent	Present	Absent	Present

FIGURE **12.1**

MARCIA'S FOUR STATUSES OF IDENTITY. According to Marcia, an individual's status in developing an identity can be described as identity diffusion, identity foreclosure, identity moratorium, or identity achievement. The status depends on the presence or absence of (1) a crisis or exploration of alternatives and (2) a commitment to an identity. *What is the identity status of most young adolescents?*

crisis Marcia's term for a period of identity development during which the adolescent is exploring alternatives.

commitment Marcia's term for the part of identity development in which adolescents show a personal investment in identity.

identity diffusion Marcia's term for the status of individuals who have not yet experienced a crisis (explored meaningful alternatives) or made any commitments.

- **Identity foreclosure** is the status of individuals who have made a commitment but not experienced a crisis. This occurs most often when parents hand down commitments to their adolescents, usually in an authoritarian way, before adolescents have had a chance to explore different approaches, ideologies, and vocations on their own.
- **Identity moratorium** is the status of individuals who are in the midst of a crisis but whose commitments are either absent or are only vaguely defined.
- **Identity achievement** is the status of individuals who have undergone a crisis and made a commitment.

> Once formed, an identity furnishes individuals with a historical sense of who they have been, a meaningful sense of who they are now, and a sense of who they might become in the future.
>
> —JAMES MARCIA
>
> *Contemporary Psychologist, Simon Fraser University*

Emerging Adulthood and Beyond A consensus is developing that the key changes in identity are more likely to take place in emerging adulthood (18 to 25 years of age) or later than in adolescence (Cote, 2009; Juang & Syed, 2010; Kroger, 2007; Luyckx & others, 2008). For example, Alan Waterman (1985, 1999) has found that from the years preceding high school through the last few years of college, the number of individuals who are identity achieved increases, whereas the number who are identity diffused decreases. Thus, college upperclassmen are more likely to be identity achieved than college freshmen or high school students. Many young adolescents, on the other hand, are identity diffused. These developmental changes are especially true for vocational choice. In terms of religious beliefs and political ideology, fewer college students reach the identity-achieved status; a substantial number are characterized by foreclosure and diffusion. Thus, the timing of identity development may depend on the particular dimension involved.

Why might college produce some key changes in identity? Increased complexity in the reasoning skills of college students combined with a wide range of new experiences that highlight contrasts between home and college and between themselves and others stimulates them to reach a higher level of integrating various dimensions of their identity (Phinney, 2008).

A recent meta-analysis of 124 studies revealed that identity moratorium status rose steadily to 19 years of age and then declined; identity achievement rose across late adolescence and early adulthood; foreclosure and diffusion statuses declined across the high school years but fluctuated in late adolescence and early adulthood (Kroger, Martinussen, & Marcia, 2010). A large portion of individuals were not identity achieved by early adulthood.

How does identity change in emerging adulthood?

Resolution of the identity issue during adolescence and emerging adulthood does not mean that identity will be stable through the remainder of life. Many individuals who develop positive identities follow what are called "MAMA" cycles; that is, their identity status changes from *m*oratorium to *a*chievement to *m*oratorium to *a*chievement (Marcia, 1994). These cycles may be repeated throughout life (Francis, Fraser, & Marcia, 1989). Marcia (2002) points out that the first identity is just that—it is not, and should not be expected to be, the final product.

Ethnic Identity Throughout the world, ethnic minority groups have struggled to maintain their ethnic identities while blending in with the dominant culture (Erikson, 1968). **Ethnic identity** is an enduring aspect of the self that includes a sense of membership in an ethnic group, along with the attitudes and feelings related to that membership. Thus, for adolescents from ethnic minority groups, the

identity foreclosure Marcia's term for the status of individuals who have made a commitment but have not experienced a crisis.

identity moratorium Marcia's term for the status of individuals who are in the midst of a crisis, but their commitments are either absent or vaguely defined.

identity achievement Marcia's term for the status of individuals who have undergone a crisis and have made a commitment.

ethnic identity An enduring, basic aspect of the self that includes a sense of membership in an ethnic group and the attitudes and feelings related to that membership.

process of identity formation has an added dimension: the choice between two or more sources of identification—their own ethnic group and the mainstream, or dominant culture (Phinney, 2008). Many adolescents resolve this choice by developing a *bicultural identity.* That is, they identify in some ways with their ethnic group and in other ways with the majority culture.

For ethnic minority individuals, adolescence and emerging adulthood are often special junctures in their development (Juang & Syed, 2010; Swanson, 2010; Phinney, 2008). Although children are aware of some ethnic and cultural differences, individuals consciously confront their ethnicity for the first time in adolescence or emerging adulthood. Unlike children, adolescents and emerging adults have the ability to interpret ethnic and cultural information, to reflect on the past, and to speculate about the future.

The indicators of identity change often differ for each succeeding generation (Phinney & Ong, 2007). First-generation immigrants are likely to be secure in their identities and unlikely to change much; they may or may not develop a new identity. The degree to which they begin to feel "American" appears to be related to whether or not they learn English, develop social networks beyond their ethnic group, and become culturally competent in their new country. Second-generation immigrants are more likely to think of themselves as "American," possibly because citizenship is granted at birth. Their ethnic identity is likely to be linked to retention of their ethnic language and social networks. In the third and later generations, the issues become more complex. Historical, contextual, and political factors that are unrelated to acculturation may affect the extent to which members of this generation retain their ethnic identities. For non-European ethnic groups, racism and discrimination influence whether ethnic identity is retained.

Researchers are also increasingly finding that a positive ethnic identity is related to positive outcomes for ethnic minority adolescents (Umana-Taylor, Updegraff, & Gonzales-Backen, 2010; Umana-Taylor & others, 2008). One study indicated that Navajo adolescents' positive ethnic heritage was linked to higher self-esteem, school connectedness, and social functioning (Jones & Galliher, 2007). And a recent longitudinal study of Latino adolescents found that ethnic identity resolution predicted proactive coping with discrimination over time (Umana-Taylor & others, 2008). Further, a recent study found that exploration was an important aspect of establishing a secure sense of one's ethnic identity, which in turn was linked to a positive attitude toward one's own group and other groups (Whitehead & others, 2009).

Michelle Chin, age 16: "Parents do not understand that teenagers need to find out who they are, which means a lot of experimenting, a lot of mood swings, a lot of emotions and awkwardness. Like any teenager, I am facing an identity crisis. I am still trying to figure out whether I am a Chinese American or an American with Asian eyes."

RELIGIOUS AND SPIRITUAL DEVELOPMENT

In Chapter 11, we described the many positive benefits of service learning. A number of studies have found that adolescents who are involved in religious institutions are more likely to engage in service learning than their counterparts who don't participate in religious institutions (Lerner, Roeser, & Phelps, 2009). Let's explore adolescents' concepts of religion and spirituality, as well as their religious and spiritual experiences.

Religious issues are important to many adolescents, but in the 21st century, a downtrend in religious interest among adolescents has occurred. In a 2007 national study of American freshmen, 78 percent said they attended a religious service frequently or occasionally during their senior year in high school, down from a high of 85 percent in 1997 (Pryor & others, 2007).

A recent developmental study revealed that religiousness declined from 14 to 20 years of age in the United States (Koenig, McGue, & Iacono, 2008) (see Figure 12.2). In this study, religiousness was assessed

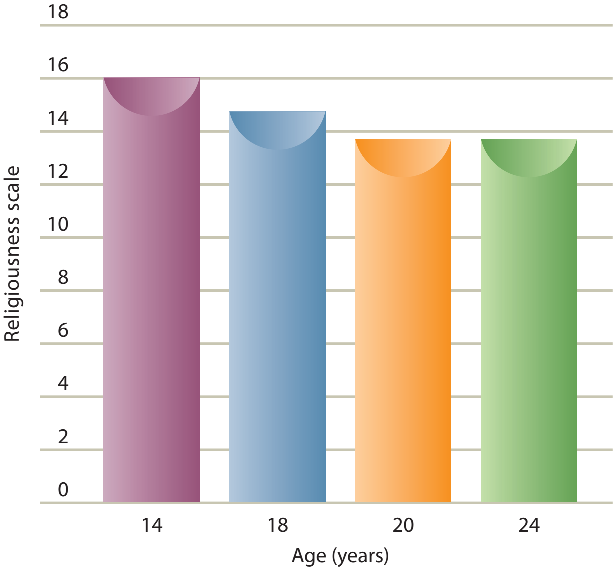


FIGURE **12.2**

DEVELOPMENTAL CHANGES IN RELIGIOUSNESS FROM 14 TO 24 YEARS OF AGE. *Note:* The religiousness scale ranged from 0 to 32 with higher scores indicating stronger religiousness.

Many children and adolescents show an interest in religion, and many religious institutions created by adults (such as this Muslim school in Malaysia) are designed to introduce them to religious benefits and ensure that they will carry on a religious tradition.

with items such as frequency of prayer, frequency of discussing religious teachings, frequency of deciding moral actions for religious reasons, and the overall importance of religion in everyday life. As indicated in Figure 12.2, more change in religiousness occurred from 14 to 18 years of age than from 20 to 24 years of age. Also, attending religious services was highest at 14 years of age, declining from 14 to 18 years of age and increasing at 20 years of age.

Researchers have found that adolescent girls are more religious than are adolescent boys (King & Roeser, 2009). One study of 13- to 17-year-olds revealed that girls are more likely to frequently attend religious services, perceive that religion shapes their daily lives, participate in religious youth groups, pray more alone, and feel closer to God (Smith & Denton, 2005).

Analysis of the World Values Survey of 18- to 24-year-olds revealed that emerging adults in less developed countries were more likely to be religious than their counterparts in more developed countries (Lippman & Keith, 2006). For example, emerging adults' reports that religion was very important in their lives ranged from a low of 0 in Japan to 93 percent in Nigeria, and belief in God ranged from a low of 40 percent in Sweden to a high of 100 percent in Pakistan.

Religion and Identity Development As we saw earlier in this chapter, identity development becomes a central focus of adolescence and emerging adulthood (Kroger, Martinussen, & Marcia, 2010). As part of their search for identity, adolescents and emerging adults begin to grapple in more sophisticated, logical ways with such questions as "Why am I on this planet?" "Is there really a God or higher spiritual

What are some positive roles of religion in adolescents' lives?

being, or have I just been believing what my parents and the church imprinted in my mind?" "What really are my religious views?"

Cognitive Development and Religion in Adolescence Many of the cognitive changes thought to influence religious development involve Piaget's cognitive developmental theory. More so than in childhood, adolescents think more abstractly, idealistically, and logically. The increase in abstract thinking lets adolescents consider various ideas about religious and spiritual concepts. For example, an adolescent might ask how a loving God can possibly exist given the extensive suffering of many people in the world (Good & Willoughby, 2008). Adolescents' increased idealistic thinking provides a foundation for thinking about whether religion provides the best route to a better, more ideal world than the present. And adolescents' increased logical reasoning gives them the ability to develop hypotheses and systematically sort through different answers to spiritual questions (Good & Willoughby, 2008).

developmental **connection**

Religion. Religion plays an important role in the lives of many individuals in adulthood and is linked to their health and coping. Chapter 15, p 495; Chapter 18, p. 587

The Positive Role of Religion in Adolescents' Lives Researchers have found that various aspects of religion are linked with positive outcomes for adolescents (Bridgers & Snarey, 2010; King & Roesser, 2009). Religion also plays a role in adolescents' health and whether they engage in problem behaviors (Cotton & others, 2006). For example, in a recent national random sample of more than 2,000 11- to 18-year-olds, those who were higher in religiosity were less likely to smoke, drink alcohol, use marijuana, not be truant from school, not engage in delinquent activities, and not be depressed than their low-religiosity counterparts (Sinha, Cnaan, & Gelles, 2006).

Many religious adolescents also adopt their religion's message about caring and concern for people. For example, in one survey religious youth were almost three times as likely to engage in community service as nonreligious youth (Youniss, McLellan, & Yates, 1999).

Review *Connect* Reflect

LG1 Discuss changes in the self, identity, and religious/spiritual development in adolescence.

Review

- What are some changes in self-esteem that take place in adolescence?
- How does identity develop in adolescence?
- What characterizes religious and spiritual development in adolescence?

Connect

- Compare what is said about inflated self-esteem in middle and late childhood in Chapter 10 to what is said in this section about potential narcissism in adolescence. What are your conclusions?

Reflect *Your Own Personal Journey of Life*

- Where are you in your identity development? Get out a sheet of paper and list each of the pieces of identity (vocational, political, religious, relationship achievement/intellectual, sexual, gender, cultural/ethnic, interest, personality, and physical) in a column on the left side of the paper. Then write the four identity statuses (diffused, foreclosed, moratorium, and achieved) across the top of the page. Next to each dimension of identity, place a check mark in the appropriate space that reflects your identity status for the particular aspect of identity. If you checked diffused or foreclosed for any of the dimensions, think about what you need to do to move on to a moratorium status in those areas.

2 Families

LG2 Describe changes that take place in adolescents' relationships with their parents.

Parental Monitoring

Autonomy and Attachment

Parent-Adolescent Conflict

Adolescence typically alters the relationship between parents and their children. Among the most important aspects of family relationships in adolescence are those that involve parental monitoring, autonomy, attachment, and parent-adolescent conflict.

What role does parental monitoring play in adolescent development?

PARENTAL MONITORING

In Chapter 10, we discussed the importance of parents as managers of children's development. A key aspect of the managerial role of parenting in adolescence is effectively monitoring the adolescent's development (Gauvain & Parke, 2010; Smetana & others, 2010). Monitoring includes supervising adolescents' choice of social settings, activities, and friends, as well as their academic efforts. Later in this chapter, we will describe lack of adequate parental monitoring as the parental factor most likely to be linked to juvenile delinquency.

Recent research on parental monitoring has shifted from an exclusive emphasis on parents' role in monitoring adolescents' whereabouts and activities to include adolescents' active role in managing their parents' access to information (Keijsers & Laird, 2010; Smetana & others, 2010; Stattin & Kerr, 2000). For example, a recent interest involving parental monitoring focuses on adolescents' voluntary disclosure (Cumsille, Darling, & Martinez, 2010; Keijsers & Laird, 2010). Adolescents' are more willing to disclose information to parents when parents ask adolescents questions and when adolescents' relationship with parents is characterized by a high level of trust, acceptance, and quality (Daddis & Randolph, 2010; Keijsers & others, 2010). Researchers have found that adolescents' disclosure to parents about their whereabouts, activities, and friends is linked to positive adolescent adjustment (Laird & Marrero, 2010; Laird, Marrero, & Sentse, 2010; Smetana, 2008).

developmental **connection**

Parenting. In authoritative parenting, parents encourage children and adolescents to be independent but still place limits and controls on their actions. Extensive verbal give-and-take is allowed and parents are warm and nurturant. Chapter 8, p. 253

AUTONOMY AND ATTACHMENT

With most adolescents, parents are likely to find themselves engaged in a delicate balancing act, weighing competing needs for autonomy and control, for independence and connection.

The Push for Autonomy The typical adolescent's push for autonomy and responsibility puzzles and angers many parents. Most parents anticipate that their teenager will have some difficulty adjusting to the changes that adolescence brings, but few parents imagine and predict just how strong an adolescent's desires will be to spend time with peers or how intensely adolescents will want to show that it is they—not their parents—who are responsible for their successes and failures.

Adolescents' ability to attain autonomy and gain control over their behavior is acquired through appropriate adult reactions to their desire for control (Laursen & Collins, 2009; McElhaney & others, 2009). At the onset of adolescence, the average individual does not have the knowledge to make appropriate or mature decisions in all areas of life. As the adolescent pushes for autonomy, the wise adult relinquishes control in those areas where the adolescent can make reasonable decisions, but continues to guide the adolescent

When I was a boy of 14, my father was so ignorant I could hardly stand to have the man around. But when I got to be 21, I was astonished at how much he had learnt in 7 years.

—MARK TWAIN

American Writer and Humorist, 19th Century to make reasonable decisions in areas in which the adolescent's knowledge is more limited. Gradually, adolescents acquire the ability to make mature decisions on their own.

Gender differences characterize autonomy-granting in adolescence. Boys are given more independence than girls. In one study, this was especially true in U.S. families with a traditional gender-role orientation (Bumpus, Crouter, & McHale, 2001). Also, Latino parents protect and monitor their daughters more closely than is the case for non-Latino White parents (Allen & others, 2008; Updegraff & others, 2010).

developmental **connection**

Attachment. In secure attachment in infancy, babies use the caregiver as a secure base from which to explore the environment. Chapter 6, p. 191

The Role of Attachment Recall from Chapter 6 that one of the most widely discussed aspects of socioemotional development in infancy is secure attachment to caregivers. In the past decade, researchers have explored whether secure attachment also might be an important concept in adolescents' relationships with their parents (Laursen & Collins, 2009). For example, Joseph Allen and his colleagues (2009) found that adolescents who were securely attached at 14 years of age were more likely to report that they were in an exclusive relationship, comfortable with intimacy in relationships, and increasing financial independence at 21 years of age.

Stacey Christensen, age 16: "I am lucky enough to have open communication with my parents. Whenever I am in need or just need to talk, my parents are there for me. My advice to parents is to let your teens grow at their own pace, be open with them so that you can be there for them. We need guidance, our parents need to help but not be too overwhelming."

Balancing Freedom and Control We have seen that parents play very important roles in adolescent development (Laursen & Collins, 2009; McElhaney & others, 2009). Although adolescents are moving toward independence, they still need to stay connected with families (Hair & others, 2008). For example, the National Longitudinal Study on Adolescent Health of more than 12,000 adolescents found that those who did not eat dinner with a parent five or more days a week had dramatically higher rates of smoking, drinking, marijuana use, getting into fights, and initiation of sexual activity (Council of Economic Advisors, 2000).

PARENT-ADOLESCENT CONFLICT

Although parent-adolescent conflict increases in early adolescence, it does not reach the tumultuous proportions G. Stanley Hall envisioned at the beginning of the 20th century (Laursen & Collins, 2009). Rather, much of the conflict involves the everyday events of family life, such as keeping a bedroom clean, dressing neatly, getting home by a certain time, and not talking forever on the phone. The conflicts rarely involve major dilemmas such as drugs or delinquency.

Conflict with parents often escalates during early adolescence, remains somewhat stable during the high school years, and then lessens as the adolescent reaches 17 to 20 years of age. Parent-adolescent relationships become more positive if adolescents go away to college than if they attend college while living at home (Sullivan & Sullivan, 1980).

The everyday conflicts that characterize parent-adolescent relationships may actually serve a positive developmental function. These minor disputes and negotiations facilitate the adolescent's transition from being dependent on parents to becoming an autonomous individual. Recognizing that conflict and negotiation can serve a positive developmental function can tone down parental hostility.

The old model of parent-adolescent relationships suggested that as adolescents mature they detach themselves from parents and move into a world of autonomy apart from parents. The old model also suggested that parent-adolescent conflict is intense and stressful throughout adolescence. The new model emphasizes that parents serve as important attachment figures and support systems while adolescents explore a wider, more complex social world. The new model also emphasizes that in most families parent-adolescent conflict is moderate rather than severe and that the everyday negotiations and minor disputes not only are normal but

Conflict with parents increases in early adolescence. *What is the nature of this conflict in a majority of American families?*

Old Model

Autonomy, detachment from parents; parent and peer worlds are isolated

Intense, stressful conflict throughout adolescence; parent-adolescent relationships are filled with storm and stress on virtually a daily basis

New Model

Attachment and autonomy; parents are important support systems and attachment figures; adolescent-parent and adolescent-peer worlds have some important connections

Moderate parent-adolescent conflict is common and can serve a positive developmental function; conflict greater in early adolescence

FIGURE **12.3**

OLD AND NEW MODELS OF PARENT-ADOLESCENT RELATIONSHIPS

also can serve the positive developmental function of helping the adolescent make the transition from childhood dependency to adult independence (see Figure 12.3).

Still, a high degree of conflict characterizes some parent-adolescent relationships. And this prolonged, intense conflict is associated with various adolescent problems: movement out of the home, juvenile delinquency, school dropout, pregnancy and early marriage, membership in religious cults, and drug abuse (Brook & others, 1990).

Review *Connect* Reflect

LG2 Describe changes that take place in adolescents' relationships with their parents.

Review

- How do needs for autonomy and attachment develop in adolescence?
- What characterizes parent-adolescent conflict?
- What role does parental monitoring play in adolescent development?

Connect

- Adolescence is identified as the second time in an individual's life when seeking independence is especially strong. When is the other time and what characterizes it?

Reflect *Your Own Personal Journey of Life*

- How much autonomy did your parents give you in adolescence? Too much? Too little? How intense was your conflict with your parents during adolescence? What were the conflicts mainly about? Would you behave differently toward your own adolescents than your parents did with you? If so, how?

3 Peers

LG3 Characterize the changes that occur in peer relationships during adolescence.

Friendships | Peer Groups | Dating and Romantic Relationships

Peers play powerful roles in the lives of adolescents (Brown & Dietz, 2009; Vitaro, Boivin, & Bukowski, 2009). Peer relations undergo important changes in adolescence, including changes in friendships and in peer groups and the beginning of romantic relationships.

FRIENDSHIPS

For most children, being popular with their peers is a strong motivator. Beginning in early adolescence, however, teenagers typically prefer to have a smaller number of friendships that are more intense and intimate than those of young children.

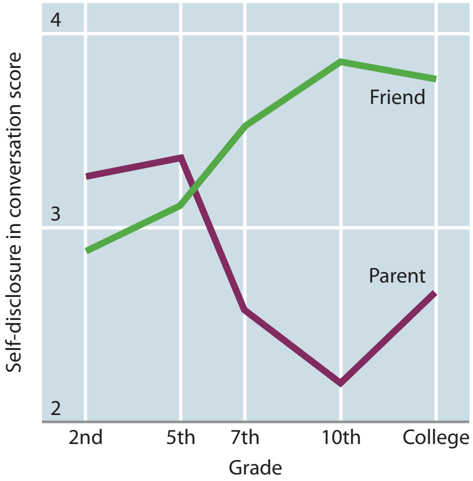


FIGURE **12.4**

DEVELOPMENTAL CHANGES IN SELF-DISCLOSING CONVERSATIONS. Self-disclosing conversations with friends increased dramatically in adolescence while declining in an equally dramatic fashion with parents. However, self-disclosing conversations with parents began to pick up somewhat during the college years. The measure of self-disclosure involved a 5-point rating scale completed by the children and youth with a higher score representing greater self-disclosure. The data shown represent the means for each age group.

developmental **connection**

Gender. Recent research indicates that relational aggression occurs more in girls than boys in adolescence but not childhood. Chapter 10, p. 326

Harry Stack Sullivan (1953) was the most influential theorist to discuss the importance of adolescent friendships. During adolescence, said Sullivan, friends become increasingly important in meeting social needs. In particular, Sullivan argued that the need for intimacy intensifies during early adolescence, motivating teenagers to seek out close friends. If adolescents fail to develop such close friendships, they experience loneliness and a reduced sense of self-worth.

Many of Sullivan's ideas have withstood the test of time. For example, adolescents report disclosing intimate and personal information to their friends more often than do younger children (Buhrmester, 1998) (see Figure 12.4). Adolescents also say they depend more on friends than on parents to satisfy their needs for companionship, reassurance of worth, and intimacy. The ups and downs of experiences with friends shape adolescents' well-being (Bukowski, Motzoi, & Meyer, 2009; Laursen & Pursell, 2009).

Gossip about peers often dominates the conversation of friends in adolescence (Buhrmester & Chong, 2009). Much of the gossip is characterized by negative comments about others, such as talking about how someone got drunk last weekend, how unattractive someone looked at school yesterday, or how someone could have the nerve to say what they did. In some cases, the negative gossip takes the form of *relational aggression*, which involves spreading disparaging rumors to harm someone (discussed in Chapter 10). However, not all gossip among friends is negative. Some gossip can involve collaborative construction that contributes to developing perspectives on intimacy and close relationships. Friends also can show their trust by disclosing risky opinions. The talk-featured, gossip aspect of friendship is more common in girls than boys.

The characteristics of friends have an important influence on adolescent development (Erath & others, 2010; Vitaro, Boivin, & Bukowski, 2009). A recent study revealed that friends' grade-point average was a consistent predictor of positive school achievement and also was linked to a lower level of negative behavior in areas such as drug abuse and acting out (Cook, Deng, & Morgano, 2007).

How do characteristics of an adolescent's friends influence whether the friends have a positive or negative influence on the adolescent?

Although most adolescents develop friendships with individuals who are close to their own age, some adolescents become best friends with younger or older individuals. Do older friends encourage adolescents to engage in delinquent behavior or early sexual behavior? Adolescents who interact with older youth do engage in more problem behaviors, such as delinquency and early sexual behavior (Poulin & Pedersen, 2007).

To read about strategies for helping adolescents develop friendships, see *Connecting Development to Life*.

PEER GROUPS

How extensive is peer pressure in adolescence? What roles do cliques and crowds play in adolescents' lives? As we see next, researchers have found that the standards of peer groups and the influence of crowds and cliques become increasingly important during adolescence.

Peer Pressure Young adolescents conform more to peer standards than

connecting development to life

Effective and Ineffective Strategies for Making Friends

Here are some strategies that adults can recommend to adolescents for making friends (Wentzel, 1997):

- *Initiate interaction.* Learn about a friend: Ask for his or her name, age, favorite activities. Use these prosocial overtures: Introduce yourself, start a conversation, and invite him or her to do things.
- *Be nice.* Show kindness, be considerate, and compliment the other person.
- *Engage in prosocial behavior.* Be honest and trustworthy: Tell the truth, keep promises. Be generous, share, and be cooperative.
- *Show respect for yourself and others.* Have good manners, be polite and courteous, and listen to what others have to say. Have a positive attitude and personality.
- *Provide social support.* Show you care.

What are some effective and ineffective strategies for making friends?

And here are some inappropriate strategies for making friends that adults can recommend that adolescents avoid using (Wentzel, 1997):

- *Be psychologically aggressive.* Show disrespect and have bad manners. Use others, be uncooperative, don't share, ignore others, gossip, and spread rumors.
- *Present yourself negatively.* Be self-centered, snobby, conceited, and jealous; show off; care only about yourself. Be mean, have a bad attitude, be angry, throw temper tantrums, and start trouble.
- *Behave antisocially.* Be physically aggressive, yell at others, pick on them, make fun of them, be dishonest, tell secrets, and break promises.

Based on what you read earlier in this chapter, what else might you recommend to an adolescent about whom to approach as a potential friend?

children do. Around the eighth and ninth grades, conformity to peers—especially to their antisocial standards—peaks (Brown & Larson, 2009; Brown & others, 2008). At this point, adolescents are most likely to go along with a peer to steal hubcaps off a car, draw graffiti on a wall, or steal cosmetics from a store counter. One study found that U.S. adolescents are more likely than Japanese adolescents to put pressure on their peers to resist parental influence (Rothbaum & others, 2000).

Which adolescents are most likely to conform to peers? Mitchell Prinstein and his colleagues (Cohen & Prinstein, 2006; Prinstein, 2007; Prinstein & Dodge, 2008) have recently conducted research that revealed adolescents who are uncertain about their social identity, which can appear in the form of low self-esteem and high social anxiety, are most likely to conform to peers. This uncertainty often increases during times of transition, such as school and family transitions. Also peers are more likely to conform when they are in the presence of someone they perceive to have higher status than they do.

Cliques and Crowds Cliques and crowds assume more important roles in the lives of adolescents than children (Brown & Dietz, 2009; Brown & others, 2008). **Cliques** are small groups that range from 2 to about 12 individuals and average about 5 to 6 individuals. The clique members are usually of the same sex and about the same age.

Some cliques form because of friendship. In the high school years, friendship cliques become more heterosexual with many high school seniors averaging two

What characterizes peer pressure in adolescence?

clique A small group that ranges from 2 to about 12 individuals, averaging about 5 to 6 individuals, and can form because adolescents engage in similar activities.

Teenagers are people who express a burning desire to be different by dressing exactly alike.

—ANONYMOUS

opposite-sex and four same-sex friendships compared to none or one opposite-sex and five or more same-sex friendships in sixth graders (Buhrmester & Chong, 2009). These mixed-sex friendships can provide adolescents with access to potential romantic partners.

Cliques can form because adolescents engage in similar activities, such as being in a club or on a sports team. Some cliques also form because of friendship. Several adolescents may form a clique because they have spent time with each other, share mutual interests, and enjoy each other's company.

Crowds are larger than cliques and less personal. Adolescents are usually members of a crowd based on reputation, and they may or may not spend much time together. Many crowds are defined by the activities adolescents engage in (such as "jocks" who are good at sports or "druggies" who take drugs) (Brown & others, 2008). Reputation-based crowds often appear for the first time in early adolescence and usually become less prominent in late adolescence (Collins & Steinberg, 2006).

What characterizes adolescent cliques? How are they different from crowds?

DATING AND ROMANTIC RELATIONSHIPS

Adolescents spend considerable time either dating or thinking about dating (Collins, Welsh, & Furman, 2009; Connolly & McIsaac, 2009). Dating can be a form of recreation, a source of status, a setting for learning about close relationships, as well as a way of finding a mate.

Developmental Changes in Dating and Romantic Relationships

Three stages characterize the development of romantic relationships in adolescence (Connolly & McIsaac, 2009):

1. *Entry into romantic attractions and affiliations at about 11 to 13 years of age.* This initial stage is triggered by puberty. From 11 to 13, adolescents become intensely interested in romance and it dominates many conversations with same-sex friends. Developing a crush on someone is common and the crush often is shared with a same-sex friend. Young adolescents may or may not interact with the individual who is the object of their infatuation. When dating occurs, it usually occurs in a group setting.
2. *Exploring romantic relationships at approximately 14 to 16 years of age.* At this point in adolescence, two types of romantic involvement occur: (a) *Casual dating* emerges between individuals who are mutually attracted. These dating experiences are often short lived, last a few months at best, and usually only endure for a few weeks. (b) *Dating in groups* is common and reflects embeddedness in the peer context. Friends often act as a third-party facilitator of a potential dating relationship by communicating their friend's romantic interest and confirming whether this attraction is reciprocated.
3. *Consolidating dyadic romantic bonds at about 17 to 19 years of age.* At the end of the high school years, more serious romantic relationships develop. This is characterized by strong emotional bonds more closely resembling those in adult romantic relationships. These bonds often are more stable and enduring than earlier bonds, typically lasting one year or more.

Two variations on these stages in the development of romantic relationships in adolescence involve early and late bloomers (Connolly & McIssac, 2009). *Early bloomers* include 15 to 20 percent of 11- to 13-year-olds who say that they currently are in a romantic relationship and 35 percent who indicate that they have had some prior experience in romantic relationships. *Late bloomers* comprise approximately 10 percent of 17- to 19-year-olds who say that they have had no experience with romantic relationships and another 15 percent who report that

crowd A crowd is a larger group structure than a clique and is usually formed based on reputation; members may or may not spend much time together.

they have not engaged in any romantic relationships that lasted more than four months.

Dating in Gay and Lesbian Youth Recently, researchers have begun to study romantic relationships in gay and lesbian youth (Diamond & Savin-Williams, 2009). Many sexual minority youth date other-sex peers, which can help them to clarify their sexual orientation or disguise it from others (Savin-Williams, 2007). Most gay and lesbian youth have had some same-sex sexual experience, often with peers who are "experimenting." Some gay and lesbian youth continue to have a same-sex orientation while others have a primarily heterosexual orientation (Diamond & Savin-Willliams, 2009). In one study, gay and lesbian youth rated the breakup of a current romance as their second most stressful problem, second only to disclosure of their sexual orientation to their parents (D'Augelli, 1991).

What are some ethnic variations in dating during adolescence?

Sociocultural Contexts and Dating The sociocultural context exerts a powerful influence on adolescents' dating patterns (Crissey, 2009). This influence may be seen in differences in dating patterns among ethnic groups within the United States. For example, one study found that Asian American adolescents were less likely to have been involved in a romantic relationship in the past 18 months than African American or Latino adolescents (Carver, Joyner, & Udry, 2003).

Values, religious beliefs, and traditions often dictate the age at which dating begins, how much freedom in dating is allowed, whether dates must be chaperoned by adults or parents, and the roles of males and females in dating. For example, Latino and Asian American cultures have more conservative standards regarding adolescent dating than does the Anglo-American culture. Dating may become a source of conflict within a family if the parents have immigrated from cultures in which dating begins at a late age, little freedom in dating is allowed, dates are chaperoned, and adolescent girl dating is especially restricted. When immigrant adolescents choose to adopt the ways of the dominant U.S. culture (such as unchaperoned dating), they often clash with parents and extended-family members who have more traditional values.

Dating and Adjustment Researchers have linked dating and romantic relationships with various measures of how well adjusted adolescents are (Collins, Welsh, & Furman, 2009; Connolly & McIsaac, 2009). For example, a recent study of 200 10th graders revealed that the more romantic experiences they had, the more they reported higher levels of social acceptance, friendship competence, and romantic competence; however, having more romantic experience also was linked to a higher level of substance use, delinquency, and sexual behavior (Furman, Low, & Ho, 2009). A recent study of adolescent girls found that those who engaged in co-rumination (excessive discussion of problems with friends) were more likely to be involved in a romantic relationship, and together co-rumination and romantic involvement predicted an increase in depressive symptoms (Starr & Davila, 2009).

Dating and romantic relationships at an early age can be especially problematic (Connolly & McIsaac, 2009). Researchers have found that early dating and "going with" someone are linked with adolescent pregnancy and problems at home and school (Florsheim, Moore, & Edgington, 2003).

How are romantic relationships linked to adolescent adjustment?

Review *Connect* Reflect

LG3 Characterize the changes that occur in peer relations during adolescence.

Review

- What changes take place in friendship during adolescence?
- What are adolescents' peer groups like?
- What is the nature of adolescent dating and romantic relationships?

Connect

- Relational aggression was discussed here and in Chapter 10. In one of the studies in Chapter 10, what connection was made between parents and the relational aggression of their children?

Reflect *Your Own Personal Journey of Life*

- What were your peer relationships like during adolescence? What peer groups were you involved in? How did they influence your development? What were your dating and romantic relationships like in adolescence? If you could change anything about the way you experienced peer relations in adolescence, what would it be?

4 Culture and Adolescent Development

LG4 Explain how culture influences adolescent development.

Cross-Cultural Comparisons | Ethnicity | The Media

In this section, we will discuss cross-cultural variations in a number of aspects of adolescent development. We also will examine how ethnicity affects U.S. adolescents and their development. And we will explore an important aspect of the cultural worlds of adolescents—the media.

CROSS-CULTURAL COMPARISONS

What traditions remain for adolescents around the globe? What circumstances are changing adolescents' lives?

Traditions and Changes in Adolescence Around the Globe Depending on the culture, adolescence may involve many different experiences (Larson, Wilson, & Rickman, 2009; Schlegel, 2009).

Health Adolescent health and well-being have improved in some respects but not in others. Overall, fewer adolescents around the world die from infectious diseases and malnutrition now than in the past (UNICEF, 2009). However, a number of adolescent health-compromising behaviors (especially illicit drug use and unprotected sex) are increasing in frequency. Extensive increases in the rates of HIV in adolescents have occurred in many sub-Saharan countries (UNICEF, 2009).

Gender Around the world, the experiences of male and female adolescents continue to be quite different (Brown & Larson, 2002; Larson, Wilson, & Rickman, 2009). Except in a few regions, such as Japan, the Philippines, and Western countries, males have far greater access to educational opportunities than females (UNICEF, 2009). In many countries, adolescent females have less freedom than males to pursue a variety of careers and engage in various leisure activities. Gender differences in sexual expression are widespread, especially in India, Southeast Asia, Latin America, and Arab countries where there are far more restrictions on the sexual activity of adolescent females than on males. These gender differences do appear to be narrowing over time, however. In some countries, educational and career opportunities for women are expanding, and control over adolescent girls' romantic and sexual relationships is weakening.

Asian Indian adolescents in a marriage ceremony

Muslim school in Middle East with boys only

Street youth in Rio de Janeiro

Family In some countries, adolescents grow up in closely knit families with extensive extended kin networks that retain a traditional way of life. For example, in Arab countries "adolescents are taught strict codes of conduct and loyalty" (Brown & Larson, 2002, p. 6). However, in Western countries such as the United States, parenting is less authoritarian than in the past, and much larger numbers of adolescents are growing up in divorced families and stepfamilies.

In many countries around the world, current trends "include greater family mobility, migration to urban areas, family members working in distant cities or countries, smaller families, fewer extended-family households, and increases in mothers' employment" (Brown & Larson, 2002, p. 7). Unfortunately, many of these changes may reduce the ability of families to spend time with their adolescents.

Peers Some cultures give peers a stronger role in adolescence than others (Brown & others, 2008). In most Western nations, peers figure prominently in adolescents' lives, in some cases taking on roles that are otherwise assumed by parents. Among street youth in South America, the peer network serves as a surrogate family that supports survival in dangerous and stressful settings. In other regions of the world, such as in Arab countries, peer relations are restricted, especially for girls (Booth, 2002).

Time Allocation to Different Activities Reed Larson & his colleagues (Larson, 2001; Larson & Verma, 1999; Larson, Wilson, & Rickman, 2009; Larson & others, 2007) have examined how adolescents spend their time in work, play, and developmental activities such as school. U.S. adolescents spend about 60 percent as much time on schoolwork as East Asian adolescents do, which is mainly due to U.S. adolescents doing less homework (Larson & Verma, 1999).

What U.S. adolescents have in greater quantities than adolescents in other industrialized countries is discretionary time (Larson & Wilson, 2004; Larson, Wilson, & Rickman, 2009). About 40 to 50 percent of U.S. adolescents' waking hours (not counting summer vacations) is spent in discretionary activities compared with 25 to 35 percent in East Asia and 35 to 45 percent in Europe. Whether this additional discretionary time is a liability or an asset for U.S. adolescents, of course, depends on how they use it.

According to Larson (2001), for optimal development, U.S. adolescents may have too much unstructured time because when adolescents are allowed to choose what they do with their time, they typically engage in unchallenging activities such

How do East Asian and U.S. adolescents spend their time differently?

These Congolese Kota boys painted their faces as part of a rite of passage to adulthood. *What rites of passage do American adolescents have?*

as hanging out and watching TV. Although relaxation and social interaction are important aspects of adolescence, it seems unlikely that spending large numbers of hours per week in unchallenging activities fosters development. Structured voluntary activities may provide more promise for adolescent development than unstructured time, especially if adults give responsibility to adolescents, challenge them, and provide competent guidance in these activities (Larson, Wilson, & Rickman, 2009; Larson & others, 2007).

In sum, adolescents' lives are characterized by a combination of change and tradition. Researchers have found both similarities and differences in the experiences of adolescents in different countries (Larson, Wilson, & Rickman, 2009; Schlegel, 2009).

Rites of Passage Another variation in the experiences of adolescents in different cultures is whether the adolescents go through a rite of passage. Some societies have elaborate ceremonies that signal the adolescent's move to maturity and achievement of adult status (Kottak, 2009). A **rite of passage** is a ceremony or ritual that marks an individual's transition from one status to another. Most rites of passage focus on the transition to adult status. In some traditional cultures, rites of passage are the avenue through which adolescents gain access to sacred adult practices, to knowledge, and to sexuality. These rites often involve dramatic practices intended to facilitate the adolescent's separation from the immediate family, especially the mother. The transformation is usually characterized by some form of ritual death and rebirth, or by means of contact with the spiritual world. Bonds are forged between the adolescent and the adult instructors through shared rituals, hazards, and secrets to allow the adolescent to enter the adult world. This kind of ritual provides a forceful and discontinuous entry into the adult world at a time when the adolescent is perceived to be ready for the change.

An especially rich tradition of rites of passage for adolescents has prevailed in African cultures, especially sub-Saharan Africa. Under the influence of Western industrialized culture, many of these rites are disappearing today, although they are still prevalent in locations where formal education is not readily available.

Do we have such rites of passage for American adolescents? We certainly do not have universal formal ceremonies that mark the passage from adolescence to adulthood. Certain religious and social groups do, however, have initiation ceremonies that indicate that an advance in maturity has been reached: the Jewish bar and bat mitzvah, the Catholic confirmation, and social debuts, for example. School graduation ceremonies come the closest to being culture-wide rites of passage in the United States. The high school graduation ceremony has become nearly universal for middle-class adolescents and increasing numbers of adolescents from low-income backgrounds.

> Consider the flowers of a garden: Though differing in kind, color, form, and shape, yet, in as much as they are refreshed by the waters of one spring, revived by the breath of one wind, invigorated by the rays of one sun, this diversity increases their charm and adds to their beauty. . . . How unpleasing to the eye if all the flowers and plants, the leaves and blossoms, the fruits, the branches, and the trees of that garden were all of the same shape and color! Diversity of hues, form, and shape enriches and adorns the garden and heightens its effect.
>
> —Abdu'l Baha
>
> *Persian Baha'i Religious Leader, 19th/20th Century*

ETHNICITY

Earlier in this chapter, we explored the identity development of ethnic minority adolescents. Here we will further examine immigration and the relationship between ethnicity and socioeconomic status.

Immigration Relatively high rates of immigration are contributing to the growth of ethnic minorities in the United States. Immigrants often experience stressors uncommon to or less prominent among longtime residents such as language barriers, dislocations and separations from support networks, changes in SES status, and the dual struggle to preserve identity and to acculturate (Fuligni, Hughes, & Way, 2009; Ho & Birman, 2010; Tamis-LeMonda & McFadden, 2010).

Many of the families that have immigrated in recent decades to the United States, such as Mexican Americans and Asian Americans, come from collectivist cultures in

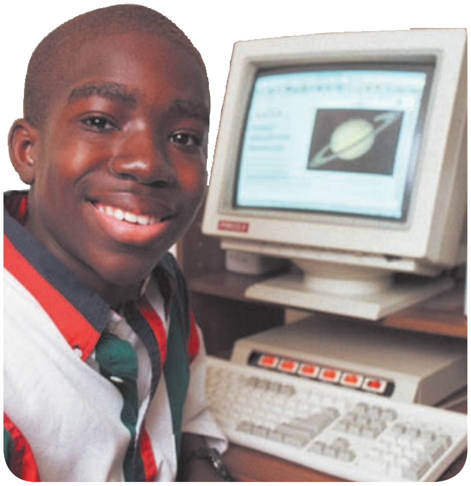
rite of passage A ceremony or ritual that marks an individual's transition from one status to another. Most rites of passage focus on the transition to adult status.

which family obligation is strong (Fuligni & Fuligni, 2007). For adolescents this family obligation may take the form of assisting parents in their occupations and contributing to the family's welfare (Tamis-LeMonda & McFadden, 2010). This often means helping out in jobs in construction, gardening, cleaning, or restaurants. In some cases, the long hours immigrant youth work in such jobs can be detrimental to their academic achievement.

Ethnicity and Socioeconomic Status Much of the research on ethnic minority adolescents has failed to tease apart the influences of ethnicity and socioeconomic status. Ethnicity and socioeconomic status can interact in ways that exaggerate the influence of ethnicity because ethnic minority individuals are overrepresented in the lower socioeconomic levels of American society (Healey, 2009; Rowley, Kurtz-Costes, & Cooper, 2010). Consequently, researchers too often have given ethnic explanations for aspects of adolescent development that were largely due instead to socioeconomic status.

Not all ethnic minority families are poor. However, poverty contributes to the stressful life experiences of many ethnic minority adolescents (Kao & Turney, 2010; McLoyd & others, 2009). Thus, many ethnic minority adolescents experience a double disadvantage: (1) prejudice, discrimination, and bias because of their ethnic minority status; and (2) the stressful effects of poverty.

Although some ethnic minority youth have middle-income backgrounds, economic advantage does not entirely enable them to escape the prejudice, discrimination, and bias associated with being a member of an ethnic minority group (McLoyd & others, 2009). In one study, discrimination of 7th- to 10th-grade African American students was related to their lower level of psychological functioning, including perceived stress, symptoms of depression, and lower perceived well-being; more positive attitudes toward African Americans were associated with more positive psychological functioning in adolescents (Sellers & others, 2006). Figure 12.5 shows the percentage of African American adolescents who reported experiencing different types of racial hassles in the past year. A recent study of 6th-grade students in the United States revealed that Chinese American children experienced discrimination from their peers that was comparable to discrimination faced by African American children (Rivas-Drake, Hughes, & Way, 2008).



Jason Leonard, age 15: "I want America to know that most of us Black teens are not troubled people from broken homes and headed to jail. . . . In my relationships with my parents, we show respect for each other and we have values in our house. We have traditions we celebrate together, including Christmas and Kwanzaa."

developmental **connection**

Environment. Poverty is linked to family turmoil, separation from a parent, violence, crowding, excessive noise, and poor housing. Chapter 1, p. 12

Type of Racial Hassle	Percent of Adolescents Who Reported the Racial Hassle in the Past Year
Being accused of something or treated suspiciously	71.0
Being treated as if you were "stupid," being "talked down to"	70.7
Others reacting to you as if they were afraid or intimidated	70.1
Being observed or followed while in public places	68.1
Being treated rudely or disrespectfully	56.4
Being ignored, overlooked, not given service	56.4
Others expecting your work to be inferior	54.1
Being insulted, called a name, or harassed	52.2

FIGURE **12.5**

AFRICAN AMERICAN ADOLESCENTS' REPORTS OF RACIAL HASSLES IN THE PAST YEAR

THE MEDIA

The culture adolescents experience not only involves cultural values, socioeconomic status, and ethnicity, but also media influences. First, we will explore adolescents' use of various media and then discuss the role of digital media in adolescents' lives.

Media Use A national study took an in-depth look at the media habits of children and adolescents (Rideout, Roberts, & Foehr, 2005). Surveying more than 2,200 children and adolescents from 8 through 18 years of age, the study confirmed that youth today are surrounded by the media. On average, they spend 6½ hours a day (44½ hours a week) with media, while spending only 2¼ hours a day with parents and just 50 minutes a day on homework. Despite all of the newly developed technologies available, the most time was spent watching TV (just over 3 hours a day). However, later in our discussion, you will see that adolescents are rapidly increasing the amount of time they spend online.

A major trend in the use of technology is the dramatic increase in media multitasking (Roberts, Henriksen, & Foehr, 2009). A recent estimate indicates that when media multitasking is taken into account, 8- to 18-year-olds use media an average of 8 hours per day (Roberts & Foehr, 2008). For example, it is not unusual for adolescents to simultaneously watch TV while text messaging their friends. In some cases,

How much time do adolescents spend using different types of media?

media multitasking—such as text messaging, listening to an iPOD, and updating a YouTube site—is engaged in at the same time as doing homework. It is hard to imagine how that can be a good thing for doing homework efficiently, although there is little research on media multitasking.

An indication of the difficulty individuals have in concentrating on driving while text messaging, recent research revealed that drivers who text message while they drive have the risk of a crash or near crash that is more than 23 times the rate of nondistracted drivers (Blanco & others, 2009; Hanowski & others, 2009). In this research, cameras continuously observed drivers for more than 6 million miles of driving. Texting drew the drivers' eyes away long enough from the road for the vehicle to travel the length of a football field at 55 miles an hour.

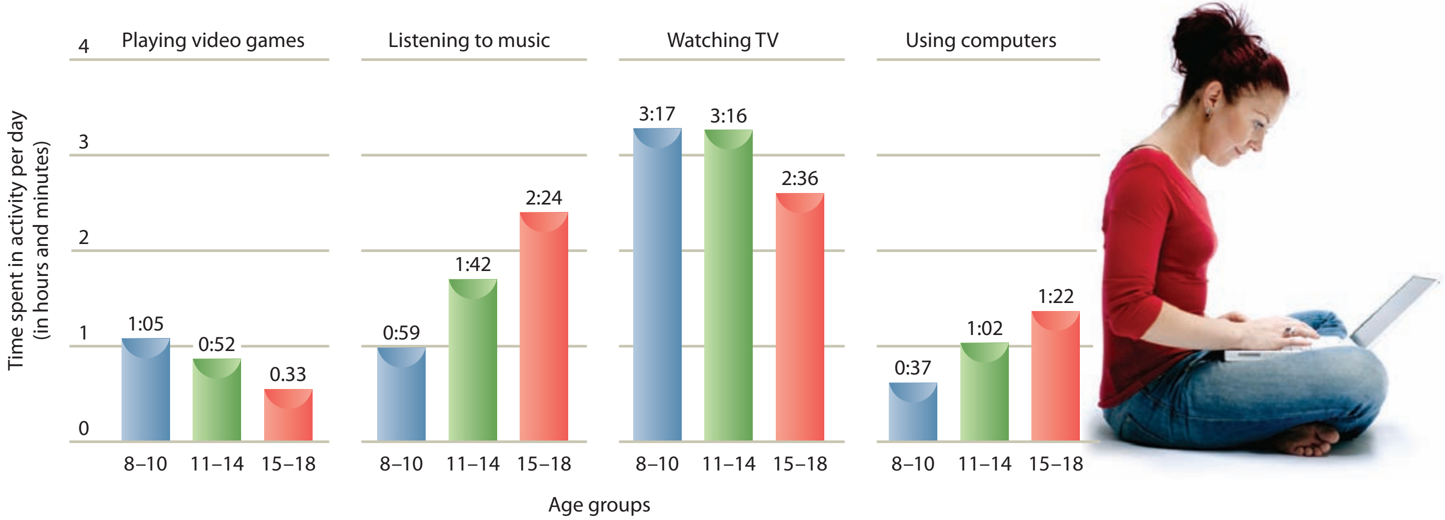
Television viewing and video game playing often peak in early adolescence and then begin to decline at some point in late adolescence in response to competing media and the demands of school and social activities (Roberts, Henriksen, & Foehr, 2009). As their TV viewing and video game playing decline, older adolescents spend more time listening to music and using the computer (see Figure 12.6).

The Online Lives of Adolescents Youth throughout the world are increasingly using the Internet, despite substantial variation in use in different countries around the world and in socioeconomic groups (Shek, Tang, & Lo, 2008; Subrahmanyan & Greenfield, 2008). For example, a recent study revealed that 17 percent of adolescents in Singapore engaged in excessive Internet use, defined as 5 hours or more a day (Mythily, Qui, & Winslow, 2008).

Recent research has found that approximately one of three adolescents self-disclose better online than in person; in this research, boys report that they feel more comfortable self-disclosing online than do girls (Schouten, Valkenburg, & Peter, 2007; Valkenburg & Peter, 2009). In contrast, girls are more likely to feel comfortable self-disclosing in person than are boys. Thus, boys' self-disclosure may benefit from online communication with friends (Valkenburg & Peter, 2009). A recent study revealed that adolescents who were better adjusted at 13 to 14 years of age were more likely to use social networking sites at 20 to 22 years of age (Mikami & others, 2010). In this study, the quality of friendship in young adolescents and their various behavioral adjustments predicted similar qualities of interaction on social

FIGURE **12.6**

DEVELOPMENTAL CHANGES IN THE AMOUNT OF TIME U.S. 8- TO 18-YEAR-OLDS SPEND WITH DIFFERENT TYPES OF MEDIA



networking sites and whether or not there would likely be problem behavior on such sites in emerging adulthood.

Special concerns have emerged about children's and adolescents' access to information on the Internet, which has been largely unregulated (Pujazon-Zazik & Park, 2010). A recent national survey indicated that 42 percent of U.S. 10- to 17-year-olds had been exposed to Internet pornography in the past year, with 66 percent of the exposure being unwanted (Wolak, Mitchell, & Finkelhor, 2007). Also, there has been a substantial increase in youth harassment and cyberbullying on the Internet (Subrahmanyam & Greenfield, 2008).

The social environment of adolescents and emerging adults on the Internet includes chat rooms, e-mail, instant messaging, blogs, and the highly popular Web site of Facebook. Many adolescents and emerging adults who use Facebook have apparently thought that the information they placed on the Web sites was private. However, it is easy for anyone to access the information, including parents, school personnel, and employers.

What characterizes the online social environment of adolescents and emerging adults?

The Internet is a technology that needs parents to monitor and regulate adolescents' use of it. Consider Bonita Williams, who began to worry about how obsessed her 15-year-old daughter, Jade, had become with MySpace (Kornblum, 2006). She became even more concerned when she discovered that Jade was posting suggestive photos of herself and gave her cell phone number out to people in different parts of the United States. She grounded her daughter, blocked MySpace at home, and moved Jade's computer out of her bedroom and into the family room.

Review *Connect* Reflect

LG4 Explain how culture influences adolescent development.

Review

- What are some comparisons of adolescents in different cultures? How do adolescents around the world spend their time? What are rites of passage?
- How does ethnicity influence adolescent development?
- What characterizes media use by adolescents?

Connect

- You just learned that adolescents watch three hours of TV a day, on average. What did you learn in Chapter 11 about TV watching and adolescents' sexual behavior and sexual knowledge?

Reflect *Your Own Personal Journey of Life*

- What is your ethnicity? Have you ever been stereotyped because of your ethnicity? How different is your identity from the mainstream culture?

5 Adolescent Problems

LG5 Identify adolescent problems in socioemotional development and strategies for helping adolescents with problems.

Juvenile Delinquency

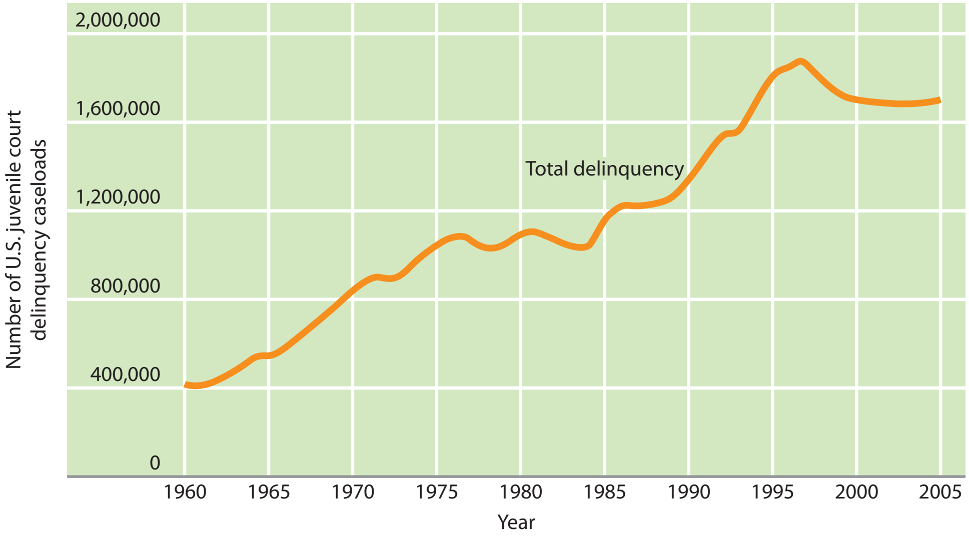
Depression and Suicide

The Interrelation of Problems and Successful Prevention/Intervention Programs

In Chapter 11, we described several adolescent problems: substance abuse, sexually transmitted infections, and eating disorders. In this chapter, we will examine the problems of juvenile delinquency, depression, and suicide. We will also explore interrelationships among adolescent problems and how such problems can be prevented or remedied.

FIGURE **12.7**

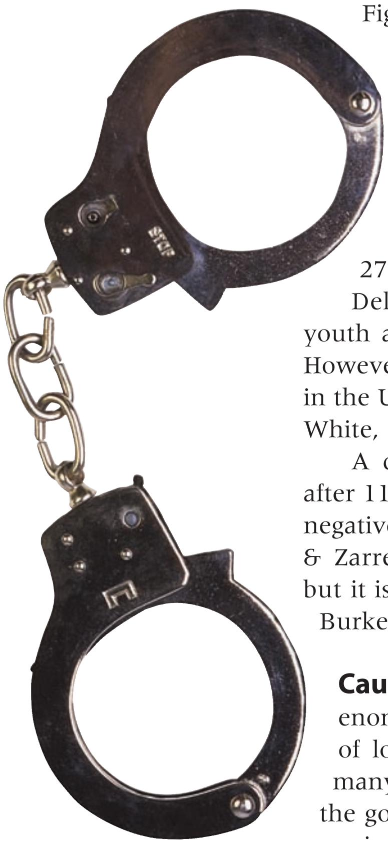
NUMBER OF U.S. JUVENILE COURT DELINQUENCY CASELOADS FROM 1960 TO 2005



JUVENILE DELINQUENCY

The label **juvenile delinquent** is applied to an adolescent who breaks the law or engages in behavior that is considered illegal. Like other categories of disorders, juvenile delinquency is a broad concept; legal infractions range from littering to murder.

The number of juvenile court delinquency caseloads in the United States increased dramatically from 1960 to 1996 but has decreased slightly since 1996 (see Figure 12.7) (Puzzanchera & Sickmund, 2008). Note that this figure reflects only adolescents who have been arrested and assigned to juvenile court delinquency caseloads and does not include those who were arrested and not assigned to the delinquency caseloads, nor does the figure include youth who committed offenses but were not apprehended.



Males are more likely to engage in delinquency than are females. However, U.S. government statistics revealed that the percentage of delinquency caseloads involving females increased from 19 percent in 1985 to 27 percent in 2005 (Puzzanchera & Sickmund, 2008).

Delinquency rates among minority groups and lower-socioeconomic-status youth are especially high in proportion to the overall population of these groups. However, such groups have less influence over the judicial decision-making process in the United States and therefore may be judged delinquent more readily than their White, middle-socioeconomic-status counterparts.

A distinction is made between early-onset—before age 11—and late-onset—after 11—antisocial behavior. Early-onset antisocial behavior is associated with more negative developmental outcomes than late-onset antisocial behavior (Schulenberg & Zarrett, 2006). Not only is it more likely to persist into emerging adulthood but it is also associated with more mental health and relationship problems (Loeber, Burke, & Pardini, 2009).

Causes of Delinquency Although delinquency is less exclusively a phenomenon of lower socioeconomic status than it was in the past, some characteristics of lower-class culture might promote delinquency (Thio, 2010). The norms of many lower-SES peer groups and gangs are antisocial, or counterproductive, to the goals and norms of society at large. Getting into and staying out of trouble are prominent features of life for some adolescents in low-income neighborhoods. Being "tough" and "masculine" are high-status traits for lower-SES boys, and these traits are often measured by the adolescent's success in performing and getting away with delinquent acts. And adolescents in communities with high crime rates observe

juvenile delinquent An adolescent who breaks the law or engages in behavior that is considered illegal.

many models who engage in criminal activities (Loeber & others, 2007). These communities may be characterized by poverty, unemployment, and feelings of alienation toward the middle class (Thio, 2010). Quality schooling, educational funding, and organized neighborhood activities may be lacking in these communities (Molnar & others, 2007). A recent study revealed that young adolescents' school connectedness buffered the effects of negative family relations and poor self-control on the development of conduct problems (Loukas, Roalson, & Herrera, 2010).

Certain characteristics of family support systems are also associated with delinquency (Farrington, 2009). Parents of delinquents are less skilled in discouraging antisocial behavior and in encouraging skilled behavior than are parents of nondelinquents. Parental monitoring of adolescents is especially important in determining whether an adolescent becomes a delinquent (Laird & others, 2008). A study of families living in high-risk neighborhoods revealed that parents' lack of knowledge of their young adolescents' whereabouts was linked to whether the adolescents engaged in delinquency later in adolescence (Lahey & others, 2008). Family discord and inconsistent and inappropriate discipline are also associated with delinquency (Bor, McGee, & Fagan, 2004). A recent study revealed that one of the factors at 8 to 10 years of age that predicted which individuals who were delinquents in adolescence would persist in engaging in criminal behavior after age 21 was harsh discipline (Farrington, Ttofi, & Coid, 2009).

Rare are the studies that actually demonstrate in an experimental design that changing parenting strategies in childhood is related to a lower incidence of juvenile delinquency in adolescence. However, one recent study by Marion Forgatch and her colleagues (2009) randomly assigned divorced mothers with sons to an experimental group (mothers received extensive parenting training) and a control group (mothers received no parental training) when their sons were in the first and third grades. The parenting training consisted of 14 parent group meetings that emphasized skill encouragement, limit setting, monitoring, problem solving, and positive involvement. Best practices for emotion regulation, managing interparental conflict, and talking with children about divorce also were included in the sessions. Improved parenting practices and reduced contact with deviant peers were linked with lower rates of delinquency in the experimental group than in the control group at a nine-year follow-up assessment.

An increasing number of studies have found that siblings can have a strong influence on delinquency (Bank, Burraston, & Snyder, 2004). Finally, having delinquent peers greatly increases the risk of becoming delinquent (Brown & Larson, 2009).

One individual whose goal is to help at-risk adolescents, such as juvenile delinquents, cope more effectively with their lives is Rodney Hammond. Read about his work in *Connecting With Careers*.

DEPRESSION AND SUICIDE

What is the nature of depression in adolescence? What causes an adolescent to commit suicide?

Depression How extensive is depression in adolescence? Rates of ever experiencing major depressive disorder range from 15 to 20 percent for adolescents (Graber & Sontag, 2009). By about age 15, adolescent females have a rate of depression that is twice that of adolescent males. Among the reasons for this gender difference are that females tend to ruminate in their depressed mood and amplify it; females' self-images, especially their body images, are more negative than males'; females face more discrimination than males do; and puberty occurs earlier for girls than for boys (Nolen-Hoeksema, 2010). As a result girls experience a piling up of changes and life experiences in the middle school years that can increase depression (Hammen, 2009).

connecting with careers

Rodney Hammond, Health Psychologist

Rodney Hammond described his college experiences:

> When I started as an undergraduate at the University of Illinois, Champaign-Urbana, I hadn't decided on my major. But to help finance my education, I took a part-time job in a child development research program sponsored by the psychology department. There, I observed inner-city children in settings designed to enhance their learning. I saw firsthand the contribution psychology can make, and I knew I wanted to be a psychologist. (American Psychological Association, 2003, p. 26).

Rodney Hammond went on to obtain a doctorate in school and community psychology with a focus on children's development. For a number of years, he trained clinical psychologists at Wright State University in Ohio and directed a program to reduce violence in ethnic minority youth. There, he and his associates taught at-risk youth how to use social skills to effectively manage conflict and to recognize situations that could lead to violence. Today, Hammond is Director of Violence Prevention at the Centers for Disease Control and Prevention in Atlanta. Hammond says that if you are interested in people and problem solving, psychology is a wonderful way to put these together.

Rodney Hammond.

Certain family factors place adolescents at risk for developing depression (Graber & Sontag, 2009; Liem, Cavell, & Lustig, 2010; Waller & Rose, 2010). These include having a depressed parent, emotionally unavailable parents, parents who have high marital conflict, and parents with financial problems.

Poor peer relationships also are associated with adolescent depression (Kistner & others, 2006). Not having a close relationship with a best friend, having less contact with friends, and experiencing peer rejection all increase depressive tendencies in adolescents. As we saw earlier in the chapter, problems in adolescent romantic relationships can also trigger depressive symptoms, especially for girls (Starr & Davila, 2009).

Friendship often provides social support. However, whether friendship is linked with a lower level of depression among girls and boys depends on the type of friendship. For example, in a recent study young adolescents with nondepressed friends were less likely to be depressed than young adolescents without friends, whereas young adolescents with depressed friends were more likely to be depressed (Brendgen & others, 2010). And a recent study of third- through ninth-graders revealed that one aspect of social support in friendship may have costs as well as benefits (Rose, Carlson, & Waller, 2007). In the study, girls' co-rumination (as reflected in excessively discussing problems) predicted not only an increase in the positive quality of the friendship, but also an increase in further co-rumination and in depressive and anxiety symptoms. The presence of rumination in girls' depression was also reflected in a recent study (Chaplin, Gillham, & Seligman, 2009). In this study of 11- to 14-year-olds, initial assessment of worry, anxiety, and oversensitivity were more strongly linked to an increase in girls' than boys' depressive symptoms one year later.

What are some characteristics of adolescents who become depressed? What are some factors that are linked with suicide attempts by adolescents?

What type of treatment is most likely to reduce depression in adolescence? A recent study revealed that depressed adolescents recovered faster when they took an antidepressant and received cognitive behavior therapy that involved improving their coping skills than when they took only an antidepressant or received only cognitive behavior therapy (The TADS Team, 2007). However, a safety concern has emerged with regard to taking antidepressants such as Prozac, and in 2004 the U.S. Food and Drug Administration assigned warnings to such drugs stating that they slightly increase the risk of suicidal behavior in adolescents (Masi, Liboni, & Brovedani, 2010). In the study just described, 15 percent of depressed adolescents who took Prozac only had suicidal thoughts or attempted suicide compared with only 6 percent receiving cognitive behavior therapy alone and 8 percent receiving Prozac plus cognitive behavior therapy.

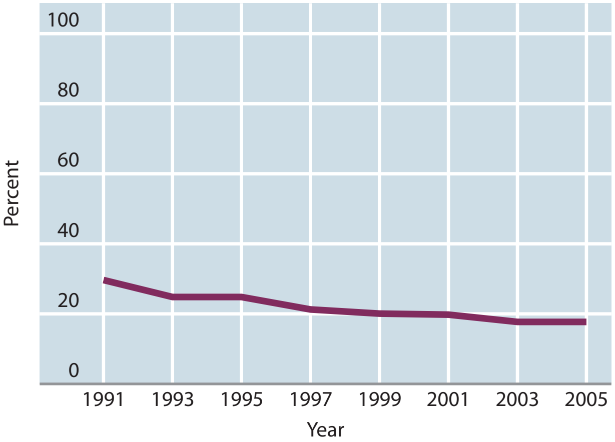


FIGURE **12.8**

PERCENTAGE OF U.S. 9TH- TO 12TH-GRADE STUDENTS WHO SERIOUSLY CONSIDERED ATTEMPTING SUICIDE IN THE PREVIOUS 12 MONTHS FROM 1991 TO 2005

Suicide Suicide behavior is rare in childhood but escalates in adolescence and then increases further in emerging adulthood (Park & others, 2006). Suicide is the third-leading cause of death in 10- to 19-year-olds today in the United States (National Center for Health Statistics, 2008; Piruccello, 2010).

Although a suicide threat should always be taken seriously, far more adolescents contemplate or attempt it unsuccessfully than actually commit it (Miranda & others, 2008). In a national study, 17 percent of U.S. high school students in 2005 said that they had seriously considered or attempted suicide in the last 12 months (Eaton & others, 2006). As shown in Figure 12.8, this percentage has declined since 1991. In the national survey, 2.3 percent reported in 2005 a suicide attempt that resulted in an injury, poisoning, or drug overdose that had been treated by a doctor. Females were more likely to attempt suicide than males, but males were more likely to succeed in committing suicide. Males use more lethal means, such as guns, in their suicide attempts, whereas adolescent females are more likely to cut their wrists or take an overdose of sleeping pills—methods less likely to result in death.

Distal, or earlier, experiences often are involved in suicide attempts as well. The adolescent may have a long-standing history of family instability and unhappiness (Wan & Leung, 2010). Just as a lack of affection and emotional support, high control, and pressure for achievement by parents during childhood are related to adolescent depression, such combinations of family experiences also are likely to show up as distal factors in adolescents' suicide attempts.

Adolescents' peer relations also are linked to suicide attempts. A recent research review revealed that prior suicide attempts by a member of an adolescent's social groups were linked to the probability the adolescent also would attempt suicide (de Leo & Heller, 2008). Adolescents who attempt suicide may lack supportive friendships. And a recent study revealed that peer victimization was linked to suicide thoughts and attempts (Klomek & others, 2008).

Cultural contexts also are linked to suicide attempts and adolescent suicide attempts vary across ethnic groups in the United States (Cho & Haslam, 2010). As indicated in Figure 12.9, more than 20 percent of American Indian/Alaska Native (AI/AN) female adolescents reported that they had attempted suicide in the previous year, and suicide accounts for almost 20 percent of AI/AN deaths in 15- to 19-year-olds (Goldston & others, 2008). As indicated in Figure 12.9, African American and non-Latino White males reported the lowest incidence of suicide attempts. A major risk factor in the high rate of suicide attempts by AI/AN adolescents is their elevated rate of alcohol abuse. A recent study revealed that continuous, escalating stress, especially at home, was linked with suicide attempts in young Latinas (Zayas & others, 2010). Results of this study reflected the

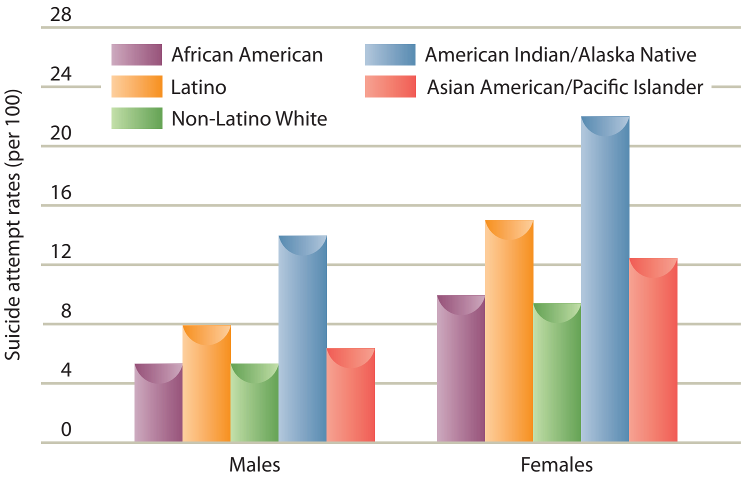


FIGURE **12.9**

SUICIDE ATTEMPTS BY U.S. ADOLESCENTS FROM DIFFERENT ETHNIC GROUPS. *Note:* Data shown are for one-year rates of self-reported suicide attempts.

cultural discontinuity experienced by young Latinas, who struggle to reconcile traditional Latina gender socialization with modern Western society.

Just as genetic factors are associated with depression, they also are associated with suicide (Kapornai & Vetro, 2008). The closer a person's genetic relationship to someone who has committed suicide, the more likely that person is to also commit suicide.

What is the psychological profile of the suicidal adolescent? Suicidal adolescents often have depressive symptoms (Woolgar & Tranah, 2010). Although not all depressed adolescents are suicidal, depression is the most frequently cited factor associated with adolescent suicide (Bethell & Rhoades, 2008; Nrugham, Holen, & Sund, 2010). Further, a recent study indicated that adolescents who used alcohol while they were sad or depressed was linked with risk for making a suicide attempt (Schilling & others, 2009). And a recent analysis using data from the National Longitudinal Study of Adolescent health found that the following were indicators of suicide risk: depressive symptoms, a sense of hopelessness, engaging in suicide ideation, having a family background of suicidal behavior, and having friends with a history of suicidal behavior (Thompson, Kuruwita, & Foster, 2009).

developmental **connection**

Conditions, Diseases, and Disorders. What characterizes depression and suicide in older adults? Chapter 18, p. 580

THE INTERRELATION OF PROBLEMS AND SUCCESSFUL PREVENTION/INTERVENTION PROGRAMS

We have described some of the major adolescent problems in this chapter and in Chapter 11: substance abuse; juvenile delinquency; school-related problems, such as dropping out of school; adolescent pregnancy and sexually transmitted infections; eating disorders; depression; and suicide.

The four problems that affect the most adolescents are (1) drug abuse, (2) juvenile delinquency, (3) sexual problems, and (4) school-related problems (Dryfoos, 1990; Dryfoos & Barkin, 2006). The adolescents most at risk have more than one of these problems. Researchers are increasingly finding that problem behaviors in adolescence are interrelated (Hipwell & others, 2010; McMurran & others, 2010). For example, heavy substance abuse is related to early sexual activity, lower grades, dropping out of school, and delinquency (Caminis & others, 2007). Early initiation of sexual activity is associated with the use of cigarettes and alcohol, the use of marijuana and other illicit drugs, lower grades, dropping out of school, and delinquency (Aalsma & others, 2010). Delinquency is related to early sexual activity, early pregnancy, substance abuse, and dropping out of school (Chew & others, 2010; D'Amico & others, 2008). As many as 10 percent of adolescents in the United States have been estimated to engage in all four of these problem behaviors (for example, adolescents who have dropped out of school are behind in their grade level, are users of heavy drugs, regularly use cigarettes and marijuana, and are sexually active but do not use contraception). In 1990, it was estimated that another 15 percent of high-risk youth engage in two or three of the four main problem behaviors (Dryfoos, 1990). Recently, this figure increased to 20 percent of all U.S. adolescents (Dryfoos & Barkin, 2006).

How are problems interrelated in adolescence? Which components of programs have been successful in preventing or reducing adolescent problems?

A review of the programs that have been successful in preventing or reducing adolescent problems found these common components (Dryfoos, 1990; Dryfoos & Barkin, 2006):

1. *Intensive individualized attention.* In successful programs, high-risk adolescents are attached to a responsible adult, who gives the adolescent attention and deals with the adolescent's specific needs. This theme occurs in a number of programs. In a successful substance-abuse program, a student assistance counselor is available full-time for individual counseling and referral for treatment.

connecting through research

Which Children Are Most Likely to Benefit From Early Intervention?

Fast Track is an intervention that attempts to lower the risk of juvenile delinquency and other problems (The Conduct Problems Prevention Research Group, 2007; Dodge & McCourt, 2010; Dodge & The Conduct Problems Prevention Research Group, 2007; Slough, McMahon, & Conduct Problems Prevention Research Group, 2008). Schools in four areas (Durham, North Carolina; Nashville, Tennessee; Seattle, Washington; and rural central Pennsylvania) were identified as high risk based on neighborhood crime and poverty data. Researchers screened more than 9,000 kindergarten children in the four schools and randomly assigned 891 of the highest-risk and moderate-risk children to intervention or control groups. The average age of the children when the intervention began was 6.5 years of age.

The 10-year intervention consisted of parent behavior management training, child social cognitive skills training, reading tutoring, home visitations, mentoring, and a revised classroom curriculum that was designed to increase socioemotional competence and decrease aggression. Outcomes were assessed in the third, sixth, and ninth grades for conduct disorder (multiple instances of behaviors such as truancy, running away, fire setting, cruelty to animals, breaking and entering, and excessive fighting across a six-month period), oppositional defiant disorder (an ongoing pattern of disobedient, hostile, and defiant behavior toward authority figures), attention deficit hyperactivity disorder (as described in Chapter 9, being characterized by one or more of these characteristics over a period of time: inattention, hyperactivity, and impulsivity), any externalizing disorder (presence of any of the three disorders previously described), and self-reported antisocial behavior (a list of 34 behaviors, such as skipping school, stealing, and attacking someone with an intent to hurt them).

The extensive intervention was successful only for children and adolescents who were identified as the highest risk in kindergarten, lowering their incidence of conduct disorder, attention deficit hyperactivity disorder, any externalized disorder, and antisocial behavior (Dodge & McCourt, 2010). Positive outcomes for the intervention occurred as early as the third grade and continued through the ninth grade. For example, in the ninth grade the intervention reduced the likelihood that the highest-risk kindergarten children would develop conduct disorder by 75 percent, attention deficit hyperactivity disorder by 53 percent, and any externalized disorder by 43 percent.

2. *Community-wide multiagency collaborative approaches.* The basic philosophy of community-wide programs is that a number of different programs and services have to be in place. In one successful substance-abuse program, a community-wide health promotion campaign has been implemented that uses local media and community education, in concert with a substance-abuse curriculum in the schools.
3. *Early identification and intervention.* Reaching younger children and their families before children develop problems, or at the beginning of their problems, is a successful strategy. One preschool program serves as an excellent model for the prevention of delinquency, pregnancy, substance abuse, and dropping out of school. Operated by the High/Scope Foundation in Ypsilanti, Michigan, the Perry Preschool has had a long-term positive impact on its students. This enrichment program, directed by David Weikart, serves disadvantaged African American children. They attend a high-quality two-year preschool program and receive weekly home visits from program personnel. Based on official police records, by age 19, individuals who had attended the Perry Preschool program were less likely to have been arrested and reported fewer adult offenses than a control group did. The Perry Preschool students also were less likely to drop out of school, and teachers rated their social behavior as more competent than that of a control group who had not received the enriched preschool experience (High/Scope Resource, 2005). To read further about which children are most likely to benefit from an early intervention, see *Connecting Through Research*.

Review *Connect* Reflect

LG5 Identify adolescent problems in socioemotional development and strategies for helping adolescents with problems.

Review

- What is juvenile delinquency? What causes it?
- What is the nature of depression and suicide in adolescence?
- How are adolescent problems interrelated? What are some components of successful prevention/intervention programs for adolescents?

Connect

- In Chapter 10, what did you learn about the connection between bullying in middle and late childhood and problems in adolescence?

Reflect *Your Own Personal Journey of Life*

- Did you have any of the problems during adolescence discussed in this chapter or Chapter 11—such as substance abuse, eating disorders, juvenile delinquency, depression, and attempted suicide? If you had one or more of the problems, why do you think you developed the problem? If you did not have one of the problems, why do you think you didn't develop one or more of them?

topical **connections**

Adolescents enter emerging adulthood at approximately 18 to 25 years of age, during which time they more intensely explore their identity and experience instability in different contexts. As adults, a secure attachment style in close relationships will benefit them. Love and possibly marriage become central aspects of many young adults' socioemotional development. Many young adults not only are marrying later or not at all but also are having children later than in past decades. Many young adults also cohabit with a romantic partner.

*looking **forward***

reach your **learning goals**

Socioemotional Development in Adolescence

1 The Self, Identity, and Religious/Spiritual Development

LG1 Discuss self, identity, and religious/spiritual development in adolescence.

Self-Esteem

- Some researchers have found that self-esteem declines in early adolescence for both boys and girls, but the drop for girls is greater. Other researchers caution that these declines are often exaggerated and actually are small. Self-esteem reflects perceptions that do not always match reality. Thus, high self-esteem may be justified or it might reflect an arrogant, grandiose view of one's self that is not warranted. Controversy characterizes whether today's adolescents and emerging adults are more narcissistic than their counterparts in earlier generations.

Identity

- Identity development is complex and is done in bits and pieces. Erikson argues that identity versus identity confusion is the fifth stage of the human life span, which individuals experience during adolescence. A psychosocial moratorium during adolescence allows the personality and role experimentation that are important aspects of identity development. James Marcia proposed four identity statuses—identity diffusion, foreclosure, moratorium, and achievement—that are based on crisis (exploration) and commitment. Increasingly, experts argue the main changes in identity occur in emerging adulthood rather than adolescence. Individuals often follow *m*oratorium-*a*chievement-*m*oratorium-*a*chievement (MAMA) cycles in their lives. Throughout the world, ethnic minority groups have struggled to maintain their identities while blending into the majority culture.

Religious and Spiritual Development

- Many adolescents show an interest in religious and spiritual development. As part of their search for identity, many adolescents and emerging adults begin to grapple with more complex aspects of religion. Various aspects of religion are linked with positive outcomes in adolescent development.

2 Families

LG2 Describe changes that take place in adolescents' relationships with their parents.

Parental Monitoring

- A key aspect of the managerial role of parenting in adolescence is effectively monitoring the adolescent's development. Monitoring includes supervising adolescents' choice of social settings, activities, friends, and academic efforts. Adolescents' disclosure to parents about their whereabouts is linked to positive adolescent adjustment.

Autonomy and Attachment

- Many parents have a difficult time handling the adolescent's push for autonomy, even though the push is one of the hallmarks of adolescence. Adolescents do not simply move into a world isolated from parents; attachment to parents increases the probability that an adolescent will be socially competent.

Parent-Adolescent Conflict

- Parent-adolescent conflict increases in adolescence. The conflict is usually moderate rather than severe, and the increased conflict may serve the positive developmental function of promoting autonomy and identity. A subset of adolescents experiences high parent-adolescent conflict, which is linked with negative outcomes.

3 Peers

LG3 Characterize the changes that occur in peer relationships during adolescence.

Friendships

- Harry Stack Sullivan was the most influential theorist to discuss the importance of adolescent friendships. He argued that there is a dramatic increase in the psychological importance and intimacy of close friends in early adolescence. Friends became increasingly important in meeting social need.

Peer Groups

- The pressure to conform to peers is strong during adolescence, especially during the eighth and ninth grades. Cliques and crowds assume more importance in the lives of adolescents than in the lives of children.

Dating and Romantic Relationships

- Dating can have many functions. Three stages characterize the development of romantic relationships in adolescence: (1) entry into romantic attractions and affiliations at about 11 to 13 years of age; (2) exploring romantic relationships at approximately 14 to 16 years of age; and (3) consolidating dyadic romantic bonds at about 17 to 19 years of age. Many gay and lesbian youth date other-sex peers, which can help them to clarify their sexual orientation or disguise it from others. Culture can exert a powerful influence on adolescent dating. Dating shows mixed connections with adjustment during adolescence. Early dating is linked with developmental problems.

4 Culture and Adolescent Development

LG4 Explain how culture influences adolescent development.

Cross-Cultural Comparisons

- There are both similarities and differences in adolescents across different countries. In some countries, traditions are being continued in the socialization of adolescents, whereas in others, substantial changes in the experiences of adolescents are taking place. Adolescents often fill their time with different activities, depending on the culture in which they live. A rite of passage is a ceremony or ritual that marks an individual's transition from one status to another, especially into adulthood. In primitive cultures, rites of passage are often well defined. In contemporary America, rites of passage to adulthood are ill-defined.

Ethnicity

- Many of the families that have immigrated in recent decades to the United States come from collectivist cultures in which there is a strong sense of family obligation. Much of the research on ethnic minority adolescents has not teased apart the influences of ethnicity and socioeconomic status. Because of this failure, too often researchers have given ethnic explanations for characteristics that were largely due to socioeconomic factors. Although not all ethnic minority families are poor, poverty contributes to the stress of many ethnic minority adolescents.

The Media

- In terms of exposure, the average U.S. 8- to 18-year-old spends 6½ hours a day using electronic media, with the most time spent watching television. If media multitasking is taken into account, they use electronic media 8 hours a day. Adolescents are rapidly increasing the time they spend online. Older adolescents reduce their TV viewing and video game playing and increase their music listening and computer use. Large numbers of adolescents and college students engage in social networking on MySpace and Facebook.

5 Adolescent Problems

LG5 Identify adolescent problems in socioemotional development and strategies for helping adolescents with problems.

Juvenile Delinquency

- A juvenile delinquent is an adolescent who breaks the law or engages in conduct that is considered illegal. Low socioeconomic status, negative family experiences (especially a low level of parental monitoring and having a sibling who is a delinquent), and negative peer influences have been linked to juvenile delinquency.

Depression and Suicide

- Adolescents and emerging adults have a higher rate of depression than children. Female adolescents and emerging adults are more likely to have mood and depressive disorders than their male counterparts. Adolescent suicide is the third leading cause of death in U.S. adolescents.

The Interrelation of Problems and Successful Prevention/Intervention Programs

- Researchers are increasingly finding that problem behaviors in adolescence are interrelated, and at-risk adolescents have one or more of these problems: (1) drug abuse, (2) juvenile delinquency, (3) sexual problems, and (4) school-related problems. Dryfoos found a number of common components in successful programs designed to prevent or reduce adolescent problems: They provide individual attention to high-risk adolescents, they develop community-wide intervention, and they include early identification and intervention.

key **terms**

narcissism 383
crisis 384
commitment 384
identity diffusion 384
identity foreclosure 385
identity moratorium 385
identity achievement 385
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clique 393
crowd 394
rite of passage 398
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key **people**

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Alan Waterman 385
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Marion Forgatch 403

section **seven**

How many roads must a man walk down before you call him a man?

—**Bob Dylan**
American Folk Singer, 20th Century

Early Adulthood

Early adulthood is a time for work and a time for love, sometimes leaving little time for anything else. For some of us, finding our place in adult society and committing to a more stable life take longer than we imagine. We still ask ourselves who we are and wonder if it isn't enough just to be. Our dreams continue and our thoughts are bold, but at some point we become more pragmatic. Sex and love are powerful passions in our lives—at time angels of light, at others fiends of torment. And we possibly will never know the love of our parents until we become parents ourselves. Section 7 contains two chapters: "Physical and Cognitive Development in Early Adulthood" (Chapter 13) and "Socioemotional Development in Early Adulthood" (Chapter 14).

chapter 13 PHYSICAL AND COGNITIVE DEVELOPMENT IN EARLY ADULTHOOD

chapter outline

1 The Transition from Adolescence to Adulthood

Learning Goal 1 Describe the transition from adolescence to adulthood.

Becoming an Adult
The Transition from High School to College

2 Physical Development

Learning Goal 2 Identify the changes in physical development in young adults.

Physical Performance and Development
Health
Eating and Weight
Regular Exercise
Substance Abuse

3 Sexuality

Learning Goal 3 Discuss sexuality in young adults.

Sexual Activity in Emerging Adulthood
Sexual Orientation and Behavior
Sexually Transmitted Infections
Forcible Sexual Behavior and Sexual Harassment

4 Cognitive Development

Learning Goal 4 Characterize cognitive changes in early adulthood.

Cognitive Stages
Creativity

5 Careers and Work

Learning Goal 5 Explain the key dimensions of career and work in early adulthood.

Developmental Changes
Finding a Path to Purpose
Monitoring the Occupational Outlook
The Impact of Work
Diversity in the Workplace

He was a senior in college when both of his parents died of cancer within five weeks of each other. What would he do? He and his 8-year-old brother left Chicago to live in California, where his older sister was entering law school. Dave would take care of his younger brother, but he needed a job. That first summer, he took a class in furniture painting; then he worked for a geological surveying company, re-creating maps on a computer. Soon, though, he did something very different: with friends from high school, Dave Eggers started *Might,* a satirical magazine for twenty-somethings. It was an edgy, highly acclaimed publication, but not a moneymaker. After a few years, Eggers had to shut down the magazine, and he abandoned California for New York.

This does not sound like a promising start for a career. But within a decade after his parents' death, Eggers had not only raised his young brother but had also founded a quarterly journal and Web site, *McSweeney's,* and had written a best-seller, *A Heartbreaking Work of Staggering Genius*, which received the National Book Critics Circle Award and was nominated for a Pulitzer Prize. It is a slightly fictionalized account of Eggers' life as he helped care for his dying mother, raised his brother, and searched for his own place in the world. Despite the pain of his loss and the responsibility for his brother, Eggers quickly built a record of achievement as a young adult.

Dave Eggers, talented and insightful author.

topical **connections**

Early adolescence is a time of dramatic physical change as puberty unfolds. Pubertal change also brings considerable interest in one's body image. And pubertal change ushers in an intense interest in sexuality. Although most adolescents develop a positive sexual identity, many encounter sexual risk factors that can lead to negative developmental outcomes. Adolescence also is a critical time in the development of behaviors related to health, such as good nutrition and regular exercise, which are health enhancing, and drug abuse, which is health compromising. Significant changes occur in the adolescent's brain—the early development of the amygdala and the delayed development of the prefrontal cortex—that may contribute to risk taking and sensation seeking. Adolescent thinking becomes more abstract, idealistic, and logical—which Piaget described as the key aspects of formal operational thought. The brain's development and social contexts influence adolescents' decision making.

looking ***back***

preview

In this chapter, we will explore many aspects of physical and cognitive development in early adulthood. These include some of the areas that were so important in Dave Eggers' life, such as maximizing creative talents and pursuing a career. We also will examine changes in physical development, sexuality, and cognitive development. We will begin where we left off in Section 6, "Adolescence," and address the transition from adolescence to adulthood, a time during which Dave Eggers displayed resilience in the face of intense stress.

1 The Transition from Adolescence to Adulthood

LG1 Describe the transition from adolescence to adulthood.

Becoming an Adult

The Transition From High School to College

When does an adolescent become an adult? In Chapter 11, we saw that it is not easy to tell when a girl or a boy enters adolescence. The task of determining when an individual becomes an adult is more difficult.

BECOMING AN ADULT

For most individuals, becoming an adult involves a lengthy transition period. Recently, the transition from adolescence to adulthood has been referred to as **emerging adulthood,** which occurs from approximately 18 to 25 years of age (Arnett, 2006, 2007). Experimentation and exploration characterize the emerging adult. At this point in their development, many individuals are still exploring which career path they want to follow, what they want their identity to be, and which lifestyle they want to adopt (for example, single, cohabiting, or married).

Key Features Jeffrey Arnett (2006) recently concluded that five key features characterize emerging adulthood:

- *Identity exploration, especially in love and work.* Emerging adulthood is the time during which key changes in identity take place for many individuals (Cote, 2009; Kroger, Martinussen, & Marcia, 2010).
- *Instability.* Residential changes peak during early adulthood, a time during which there also is often instability in love, work, and education.
- *Self-focused.* According to Arnett (2006, p. 10), emerging adults "are self-focused in the sense that they have little in the way of social obligations, little in the way of duties and commitments to others, which leaves them with a great deal of autonomy in running their own lives."
- *Feeling in-between.* Many emerging adults don't consider themselves adolescents or full-fledged adults.
- *The age of possibilities, a time when individuals have an opportunity to transform their lives.* Arnett (2006) describes two ways in which emerging adulthood is the age of possibilities: (1) many emerging adults are optimistic about their future; and (2) for emerging adults who have experienced difficult times while growing up, emerging adulthood presents an opportunity to direct their lives in a more positive direction.

Consider the changing life of Michael Maddaus (Broderick, 2003; Masten, Obradovic, & Burt, 2006). Growing up as a child and adolescent in Minneapolis, his mother drank heavily and his stepfather abused him. He coped by spending

emerging adulthood The transition from adolescence to adulthood (approximately 18 to 25 years of age) that involves experimentation and exploration.

increasing time on the streets, being arrested more than 20 times for his delinquency, frequently being placed in detention centers, and rarely going to school. At 17, he joined the Navy and the experience helped him to gain self-discipline and hope. After his brief stint in the Navy, he completed a GED and began taking community college classes. However, he continued to have some setbacks with drugs and alcohol. A defining moment as an emerging adult came when he delivered furniture to a surgeon's home. The surgeon became interested in helping Michael, and his mentorship led to Michael volunteering at a rehabilitation center, then to a job with a neurosurgeon. Eventually, he obtained his undergraduate degree, went to medical school, got married, and started a family. Today, Michael Maddaus is a successful surgeon. One of his most gratifying volunteer activities is telling his story to troubled youth.

Dr. Michael Maddaus, counseling a troubled youth.

In a longitudinal study, Ann Masten and her colleagues (2006) found that emerging adults who became competent after experiencing difficulties while growing up were more intelligent, experienced higher parenting quality, and were less likely to grow up in poverty or low-income circumstances than their counterparts who did not become competent as emerging adults. A further analysis focused on individuals who were still showing maladaptive patterns in emerging adulthood but had gotten their lives together by the time they were in the late twenties and early thirties. The three characteristics shared by these "late-bloomers" were support by adults, being planful, and showing positive aspects of autonomy.

> Whatever you, can do, or dream you can, begin it. Boldness has genius, power, and magic.
>
> —Johann Wolfgang Von Goethe
> *German Playwright and Novelist, 19th Century*

Markers of Becoming an Adult In the United States, the most widely recognized marker of entry into adulthood is holding a more or less permanent, full-time job, which usually happens when an individual finishes school—high school for some, college for others, graduate or professional school for still others. However, other criteria are far from clear. Economic independence is one marker of adult status, but achieving it is often a long process. College graduates are increasingly returning to live with their parents as they attempt to establish themselves economically. A longitudinal study found that at age 25 only slightly more than half of the participants were fully financially independent of their family of origin (Cohen & others, 2003). The most dramatic findings in this study, though, involved the extensive variability in the individual trajectories of adult roles across 10 years from 17 to 27 years of age; many of the participants moved back and forth between increasing and decreasing economic dependency.

Other studies show us that taking responsibility for oneself is likely an important marker of adult status for many individuals. In a recent study, both parents and college students agreed that taking responsibility for one's actions and developing emotional control are important aspects of becoming an adult (Nelson & others, 2007).

What we have discussed about the markers of adult status mainly characterize individuals in industrialized societies, especially Americans. Are the criteria for adulthood the same in developing countries as they are in the United States? In developing countries, marriage is more often a significant marker for entry into adulthood, and this usually occurs much earlier than the adulthood markers in the United States (Arnett, 2004).

The transition from high school to college often involves positive as well as negative features. In college, students are likely to feel grown up, be able to spend more time with peers, have more opportunities to explore different lifestyles and values, and enjoy greater freedom from parental monitoring. However, college involves a larger, more impersonal school structure and an increased focus on achievement and its assessment. *What was your transition to college like?*

THE TRANSITION FROM HIGH SCHOOL TO COLLEGE

For many individuals in developed countries, going from high school to college is an important aspect of the transition to adulthood (Bowman, 2010). Just as the transition from elementary school to middle or junior

connecting with careers

Grace Leaf, College/Career Counselor

Grace Leaf is a counselor at Spokane Community College in Washington. She has a master's degree in educational leadership and is working toward a doctoral degree in educational leadership at Gonzaga University in Washington. Her job involves teaching orientation for international students, conducting individual and group advising, and doing individual and group career planning. Leaf tries to connect students with goals and values and help them design an educational program that fits their needs and visions.

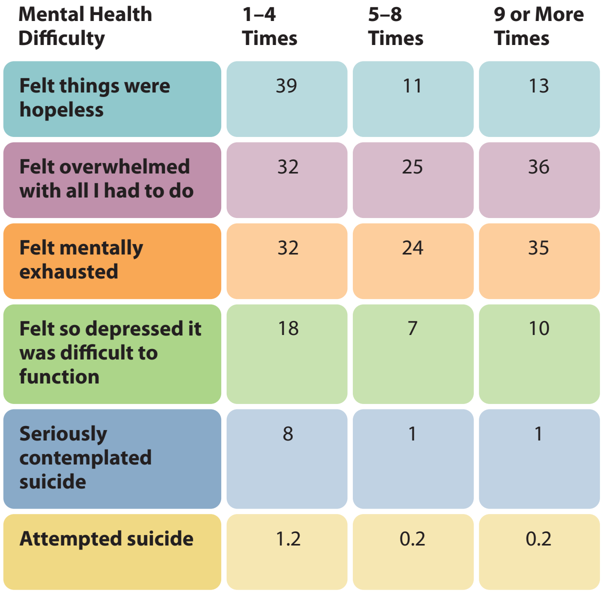
For more information about what career counselors do, see page 46 in the Careers in Life-Span Development appendix.

Grace Leaf, counseling college students at Spokane Community College about careers.

high school involves change and possible stress, so does the transition from high school to college. The two transitions have many parallels. Going from being a senior in high school to being a freshman in college replays the top-dog phenomenon of transferring from the oldest and most powerful group of students to the youngest and least powerful group of students that occurred earlier as adolescence began. For many students, the transition from high school to college involves movement to a larger, more impersonal school structure; interaction with peers from more diverse geographical and sometimes more diverse ethnic backgrounds; and increased focus on achievement and its assessment. And like the transition from elementary to middle or junior high school, the transition from high school to college can involve positive features. Students are more likely to feel grown up, have more subjects from which to select, have more time to spend with peers, have more opportunities to explore different lifestyles and values, enjoy greater independence from parental monitoring, and be challenged intellectually by academic work (Santrock & Halonen, 2010).

Today's college students experience more stress and are more depressed than in the past, according to a national study of more than 200,000 freshmen at more than 400 colleges and universities (Pryor & others, 2009). And a recent national survey conducted by the American College Health Association (2008) of more than 90,000 students on 177 campuses revealed that feeling things are hopeless, feeling overwhelmed with all they have to do, feeling mentally exhausted, feeling sad, and feeling depressed are not uncommon in college students. Figure 13.1 indicates the percentage of students who had these feelings and how many times a year they experienced them.

Most college campuses have a counseling center with access to mental health professionals who can help students learn effective ways to cope with stress. Counselors can provide good information about coping with stress and academic matters. To read about the work of college counselor Grace Leaf, see *Connecting With Careers*.



Mental Health Difficulty	**1–4 Times**	**5–8 Times**	**9 or More Times**
Felt things were hopeless	39	11	13
Felt overwhelmed with all I had to do	32	25	36
Felt mentally exhausted	32	24	35
Felt so depressed it was difficult to function	18	7	10
Seriously contemplated suicide	8	1	1
Attempted suicide	1.2	0.2	0.2

FIGURE **13.1**

COLLEGE STUDENTS' MENTAL HEALTH DIFFICULTIES IN THE PAST YEAR. *Note: Figure shows the percentage of college students who responded to the question: "Within the last school year, how many times have you . . . ?*

Review Connect Reflect

LG1 Describe the transition from adolescence to adulthood.

Review

- What is the nature of emerging adulthood? What are two main criteria for becoming an adult?
- What is the transition from high school to college like?

Connect

- In Chapter 12, you learned about some strategies for preventing or reducing adolescent problems. What strategy played a role in this section's story of Michael Maddaus?

Reflect *Your Own Personal Journey of Life*

- What do you think is the most important criterion for becoming an adult? Does it make sense to describe becoming an adult in terms of "emerging adulthood" over a period of years, or is there a specific age at which someone becomes an adult? Explain.

2 Physical Development

LG2 Identify the changes in physical development in young adults.

Physical Performance and Development

Health

Eating and Weight

Regular Exercise

Substance Abuse

As we learn more about healthy lifestyles and how they contribute to a longer life span, emerging and young adults are increasingly interested in learning about physical performance, health, nutrition, exercise, and addiction.

PHYSICAL PERFORMANCE AND DEVELOPMENT

Most of us reach our peak physical performance before the age of 30, often between the ages of 19 and 26. This peak of physical performance occurs not only for the average young adult, but for outstanding athletes as well. Different types of athletes, however, reach their peak performances at different ages. Most swimmers and gymnasts peak in their late teens. Golfers and marathon runners tend to peak in their late twenties. In other areas of athletics, peak performance is often in the early to mid-twenties. However, in recent years, some highly conditioned athletes—such as Dana Torres (Olympic swimming), Lance Armstrong (cycling), and Tom Watson (golf)— have stretched the age limit of award-winning performances.

Not only do we reach our peak in physical performance during early adulthood, but it is also during this age period that we begin to decline in physical performance. Muscle tone and strength usually begin to show signs of decline around the age of 30. Sagging chins and protruding abdomens also may begin to appear for the first time. The lessening of physical abilities is a common complaint among the just-turned thirties.

HEALTH

Emerging adults have more than twice the mortality rate of adolescents (Park & others, 2006) (see Figure 13.2). As indicated in Figure 13.2, males are mainly responsible for the higher mortality rate of emerging adults.

Although emerging adults have a higher death rate than adolescents, emerging adults have few chronic health problems, and they have fewer colds and respiratory problems than when they were children (Rimsza & Kirk, 2005). Although most college students know what it takes to prevent

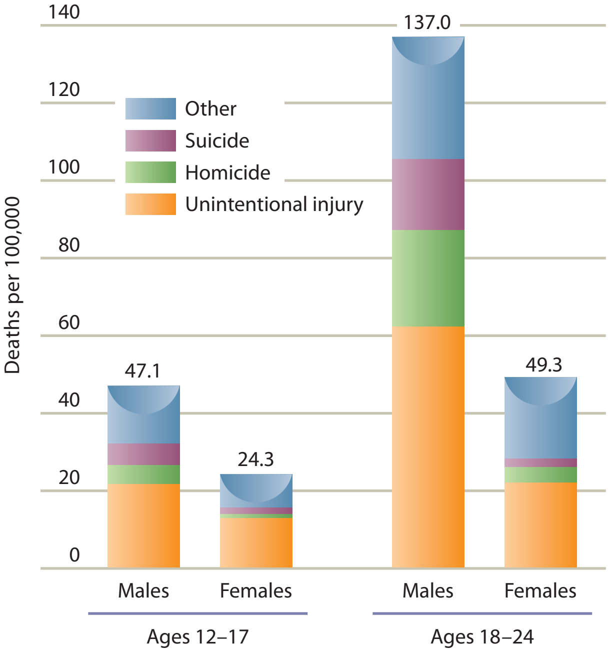


FIGURE **13.2**

MORTALITY RATES OF U.S. ADOLESCENTS AND EMERGING ADULTS

Why might it be easy to develop bad health habits in early adulthood?

illness and promote health, they don't fare very well when it comes to applying this information to themselves (Murphy-Hoefer, Alder, & Higbee, 2004).

A longitudinal study revealed that most bad health habits engaged in during adolescence increased in emerging adulthood (Harris & others, 2006). Inactivity, diet, obesity, substance abuse, reproductive health care, and health care access worsened in emerging adulthood. For example, when they were 12 to 18 years of age, only 5 percent reported no weekly exercise, but when they became 19 to 26 years of age, 46 percent said they did not exercise during a week.

In emerging and early adulthood, few individuals stop to think about how their personal lifestyles will affect their health later in their adult lives. As emerging adults, many of us develop a pattern of not eating breakfast, not eating regular meals, and relying on snacks as our main food source during the day, eating excessively to the point where we exceed the normal weight for our age, smoking moderately or excessively, drinking moderately or excessively, failing to exercise, and getting by with only a few hours of sleep at night (Cousineau, Goldstein, & Franco, 2005). These lifestyles are associated with poor health, which in turn impacts life satisfaction. In the Berkeley Longitudinal Study—in which individuals were evaluated over a period of 40 years—physical health at age 30 predicted life satisfaction at age 70, more so for men than for women (Mussen, Honzik, & Eichorn, 1982).

A recent study explored links between health behavior and life satisfaction in more than 17,000 individuals 17 to 30 years of age in 21 countries (Grant, Wardle, & Steptoe, 2009). The young adults' life satisfaction was positively related to not smoking, exercising regularly, using sun protection, eating fruit and limiting fat intake, but was not related to consuming alcohol and fiber intake.

The health profile of emerging and young adults can be improved by reducing the incidence of certain health-impairing lifestyles, such as overeating, and by engaging in health-improving lifestyles that include good eating habits, exercising regularly, and not abusing drugs (Teague & others, 2009; Waldron & Dieser, 2010).

EATING AND WEIGHT

In Chapters 7 and 9, we discussed aspects of overweight children's lives, and in Chapter 11 we examined the eating disorders of anorexia nervosa and bulimia nervosa in adolescence. Now, we will turn our attention to obesity and the extensive preoccupation that many young adults have with dieting.

Obesity Obesity is a serious and pervasive health problem for many individuals (Howel, 2010; Kruseman & others, 2010). The prevalence of obesity in U.S. adults 20 years of age and older increased from 19 percent in 1997 to 33 percent in 2006 (Centers for Disease Control and Prevention, 2008). In this survey, obesity was defined as having a body mass index (which takes into account height and weight) of 30 or more. The National Health and Nutrition Examination Survey (NHANES) recently projected that 86 percent of Americans will be overweight or obese by 2030 if current weight trends continue (Beydoun & Wang, 2009). And a study of more than 168,000 adults in 63 countries revealed that worldwide 40 percent of the men and 30 percent of the women were overweight and 24 percent of the men and 27 percent of the women were obese (Balkau & others, 2007).

Being overweight or obese are linked to increased risk of hypertension, diabetes, and cardiovascular disease (Granger & others, 2010). Being overweight or obese also are associated with mental health problems. For example, a recent study revealed that overweight women were more likely to be depressed than women who were not overweight (Ball, Burton, & Brown, 2009).

What factors are involved in obesity? The possible culprits include heredity, leptin, set point, and metabolism and environmental factors and gender.

I'LL HAVE A MONSTER TRIPLE BURGER WITH CHEESE AND GIANT FRIES...OH AND A DIET COLA, I'VE GOT TO WATCH MY WEIGHT!
menu
COLA
c fran

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Heredity Until recently, the genetic component of obesity had been underestimated by scientists. Some individuals inherit a tendency to be overweight (Holzapfel & others, 2010). Researchers have documented that animals can be inbred to have a propensity for obesity (Mathes & others, 2010; Osmond & others, 2009). Further, identical human twins have similar weights, even when they are reared apart (Collaku & others, 2004).

Leptin *Leptin* (from the Greek word *leptos,* which means "thin") is a protein that is involved in satiety (the condition of being full to satisfaction) and released by fat cells, resulting in decreased food intake and increased energy expenditure. Leptin acts as an antiobesity hormone. In humans, leptin concentrations have been linked with weight, percentage of body fat, weight loss in a single diet episode, and cumulative percentage of weight loss (de Luis & others, 2007; Rider & others, 2010). Some scientists are interested in the possibility that leptin might help obese individuals lose weight (Friedman, 2009). Two recent studies found that when obese individuals engaged in regular exercise, they lost weight, which was associated with changes in leptin levels (Nagashima & others, 2010; Rider & others, 2010).

Set Point The amount of stored fat in your body is an important factor in your *set point,* the weight you maintain when you make no effort to gain or lose weight. Fat is stored in what are called adipose cells. When these cells are filled, you do not get hungry. When people gain weight, the number of their fat cells increases. A normal-weight individual has 30 to 40 billion fat cells. An obese individual has 80 to 120 billion fat cells. Some scientists have proposed that these fat cells can shrink but might not go away.

Environmental Factors Environmental factors play an important role in obesity (Wardlaw & Smith, 2011). The human genome has not changed markedly in the last century, yet obesity has noticeably increased. The obesity rate has doubled in the United States since 1900. This dramatic increase in obesity likely is due to greater availability of food (especially food high in fat), energy-saving devices, and declining physical activity. One study found that in 2000, U.S. women ate 335 calories more a day and men 168 more a day than they did in the early 1970s (National Center for Health Statistics, 2004).

Sociocultural factors are involved in obesity, which is six times more prevalent among women with low incomes than among women with high incomes. Americans also are more obese than Europeans and people in many other areas of the world (Williams, 2005).

Dieting Ironically, although obesity is on the rise, dieting has become an obsession with many Americans (Schiff, 2011; Thompson, Manore, & Vaughan, 2011). Although many Americans regularly embark on a diet, few are successful in keeping weight off long term (Saquib & others, 2009). A recent research review of the long-term outcomes of calorie-restricting diets revealed that overall one-third to two-thirds of dieters regain more weight than they lost on their diets (Mann & others, 2007). However, some individuals do lose weight and maintain the loss (Yancy & others, 2009). How often this occurs and whether some diet programs work better than others are still open questions.

What we do know about losing weight is that the most effective programs include exercise (Fahey, Insel, & Roth, 2011; Heitman & others, 2009). A recent research review concluded that adults who engaged in diet-plus-exercise programs lost more weight than diet only programs (Wu & others, 2009). A study of approximately 2,000 U.S. adults found that exercising 30 minutes a day, planning meals, and weighing

How effective are diet programs?

themselves daily were the main strategies used by successful dieters compared with unsuccessful dieters (Kruger, Blanck, & Gillepse, 2006) (see Figure 13.3). Another recent study also revealed that daily weigh-ins are linked to maintaining weight loss (Wing & others, 2007).

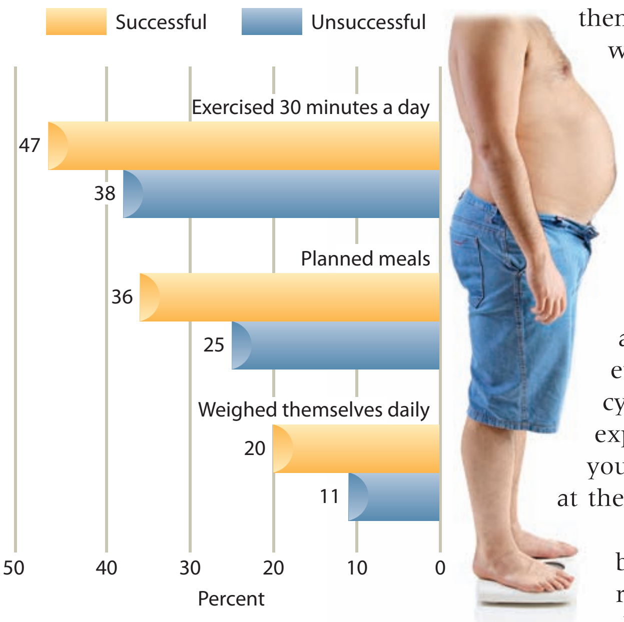

FIGURE **13.3**

COMPARISON OF STRATEGIES IN SUCCESSFUL AND UNSUCCESSFUL DIETERS

developmental **connection**

Health. Do adolescents exercise more or less than children? Chapter 11, p. 364

REGULAR EXERCISE

One of the main reasons that health experts want people to exercise is that it helps to prevent diseases, such as heart disease and diabetes (Hales, 2011; Walker & others, 2010). Many health experts recommend that young adults engage in 30 minutes or more of aerobic exercise a day, preferably every day. **Aerobic exercise** is sustained exercise—jogging, swimming, or cycling, for example—that stimulates heart and lung activity. Most health experts recommend that you raise your heart rate to at least 60 percent of your maximum heart rate. Only about one-fifth of adults, however, are active at these recommended levels of physical activity.

Researchers have found that exercise benefits not only physical health, but mental health as well. In particular, exercise improves self-concept and reduces anxiety and depression (Sylvia & others, 2009). Meta-analyses have shown that exercise can be as effective in reducing depression as psychotherapy (Richardson & others, 2005).

Research on the benefits of exercise suggests that both moderate and intense activities produce important physical and psychological gains. The enjoyment and pleasure we derive from exercise added to its aerobic benefits make exercise one of life's most important activities (Donatelle, 2011; Shaw, Clark, & Wagenmakers, 2010). Here are some helpful strategies for building exercise into your life:

- ***Reduce TV time.*** Heavy TV viewing is linked to poor health and obesity (Duvigneaud & others, 2007). Replace some of your TV time with exercise.
- ***Chart your progress.*** Systematically recording your exercise workouts will help you to chart your progress. This strategy is especially helpful over the long term.
- ***Get rid of excuses.*** People make up all kinds of excuses for not exercising. A typical excuse is, "I don't have enough time." You likely do have enough time.
- ***Imagine the alternative.*** Ask yourself whether you are too busy to take care of your own health. What will your life be like if you lose your health?

What are some strategies for incorporating exercise into your life?

SUBSTANCE ABUSE

In Chapter 11, we explored substance abuse in adolescence. Fortunately, by the time individuals reach their mid-twenties, many have reduced their use of alcohol and drugs. That is the conclusion reached by Jerald Bachman and his colleagues (2002) in a longitudinal analysis of more than 38,000 individuals who were evaluated from the time they were high school seniors through their twenties. As in adolescence, male college students and young adults are more likely to take drugs than their female counterparts (Johnston & others, 2008). A recent study revealed that only 20 percent of college students reported that they abstain from drinking alcohol (Huang & others, 2009).

Let's take a closer look at use of alcohol and nicotine by young adults and at the nature of **addiction,** which is a behavior pattern characterized by an overwhelming involvement with a drug and securing its supply.

Alcohol Let's examine two problems associated with drinking: binge drinking and alcoholism.

Binge Drinking Heavy binge drinking often increases in college, and it can take its toll on students (Kinney, 2009). Chronic binge drinking is more common among college men than women and students living away from home, especially in fraternity houses (Schulenberg & others, 2000).

In a national survey of drinking patterns on 140 campuses, almost half of the binge drinkers reported problems that included (Wechsler & others, 1994) missing classes, physical injuries, troubles with police, and having unprotected sex. For example, binge-drinking college students were 11 times more likely to fall behind in school, 10 times more likely to drive after drinking, and twice as likely to have unprotected sex than college students who did not binge drink.

Drinking alcohol before going out—called *pregaming*—has become common among college students. A recent study revealed that almost two-thirds of students on one campus had pregamed at least once in the last two weeks (DeJong, DeRicco, & Schneider, 2010). Another recent study found that two-thirds of 18- to 24-year-old women on one college pregamed (Read, Merrill, & Bytschkow, 2010). Drinking games, in which the goal is to become intoxicated, also have become common on college campuses (Cameron & others, 2010; Ham & others, 2010; McGuinness, Ahern, & Sole, 2010). Higher levels of alcohol use have been consistently linked to higher rates of sexual risk taking, such as engaging in casual sex, sex without using contraception, and sexual assaults (Lawyer & others, 2010; White & others, 2009).

What kinds of problems are associated with binge drinking in college?

A special concern is the increase in binge drinking by females during emerging adulthood (Davis & others, 2010; Smith & Berger, 2010). In a national longitudinal study, binge drinking by 19- to 22-year-old women increased from 28 percent in 1995 to 34 percent in 2007 (Johnston & others, 2008).

When does binge drinking peak during development? A longitudinal study revealed that binge drinking peaks at about 21 to 22 years of age and then declines through the remainder of the twenties (Bachman & others, 2002) (see Figure 13.4).

Alcoholism *Alcoholism* is a disorder that involves long-term, repeated, uncontrolled, compulsive, and excessive use of alcoholic beverages and that impairs the drinker's health and social relationships. One in nine individuals who drink continues the path to alcoholism. Those who do are disproportionately related to alcoholics (Hansell & others, 2009). Family studies consistently reveal a high frequency of alcoholism in the first-degree relatives of alcoholics (Kramer & others, 2008). An

aerobic exercise Sustained exercise (such as jogging, swimming, or cycling) that stimulates heart and lung activity.

addiction A pattern of behavior characterized by an overwhelming involvement with using a drug and securing its supply.

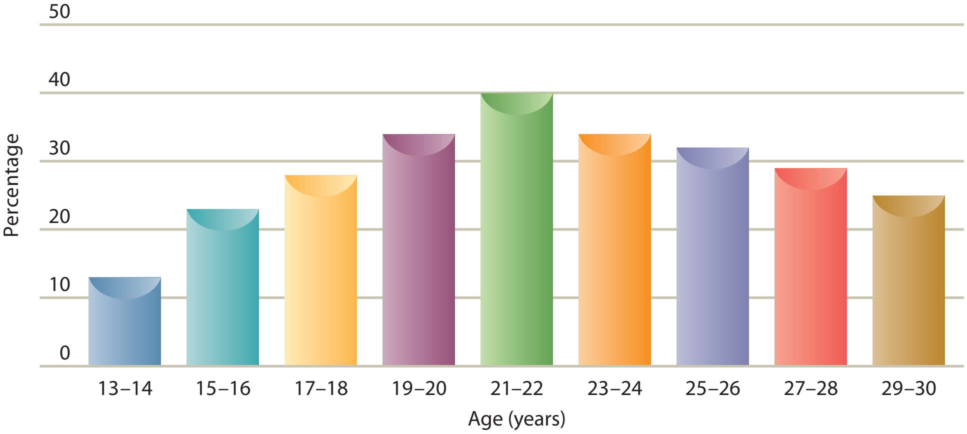

FIGURE **13.4**

BINGE DRINKING IN THE ADOLESCENCE—EARLY ADULTHOOD TRANSITION. Note that the percentage of individuals engaging in binge drinking peaked at 21 or 22 years of age and then began to gradually decline through the remainder of the twenties. Binge drinking was defined as having five or more alcoholic drinks in a row in the past two weeks.

estimated 50 to 60 percent of individuals who become alcoholics are believed to have a genetic predisposition for it.

Although studies reveal a genetic influence on alcoholism, they also show that environmental factors play a role (Bierut & others, 2010; Pautassi & others, 2010). For example, family studies indicate that many individuals who suffer from alcoholism do not have close relatives who are addicted to alcohol (Martin & Sher, 1994). Large cultural variations in alcohol use also underscore the environment's role in alcoholism. For example, Orthodox Jews and Mormons have especially low rates of alcohol use.

About one-third of alcoholics recover whether or not they are ever in a treatment program. This figure was found in a long-term study of 700 individuals over 50 years and has consistently been found by other researchers as well (Vaillant, 1992). There is a "one-third rule" for alcoholism: By age 65, one-third are dead or in terrible shape, one-third are abstinent or drinking socially, and one-third are still trying to beat their addiction. A positive outcome and recovery from alcoholism are predicted by certain factors: (1) a strong negative experience related to drinking, such as a serious medical emergency or condition; (2) finding a substitute dependency to compete with alcohol abuse, such as meditation, exercise, or overeating (which of course has its own negative health consequences); (3) having new social supports (such as a concerned, helpful employer or a new marriage); and (4) joining an inspirational group, such as a religious organization or Alcoholics Anonymous (Vaillant, 1992).

developmental **connection**

Health. Many individuals who smoke in emerging adulthood and early adulthood began smoking during adolescence. Chapter 11, p. 367

Cigarette Smoking and Nicotine Converging evidence from a number of studies underscores the dangers of smoking or being around those who do (American Cancer Society, 2010). For example, smoking is linked to 30 percent of cancer deaths, 21 percent of heart disease deaths, and 82 percent of chronic pulmonary disease deaths. Secondhand smoke is implicated in as many as 9,000 lung cancer deaths a year. Children of smokers are at special risk for respiratory and middle-ear diseases (Goodwin & Cowles, 2008).

Fewer people smoke today than in the past, and almost half of all living adults who ever smoked have quit. In the United States, the prevalence of smoking in men has dropped from 42 percent in 1965 to 20.6 percent in 2007 (National Center for Health Statistics, 2010a). However, more than 50 million Americans still smoke cigarettes today.

Most adult smokers would like to quit, but their addiction to nicotine often makes quitting a challenge (Travis & Lawrance, 2009). Nicotine, the active drug in cigarettes, is a stimulant that increases the smoker's energy and alertness, a pleasurable and reinforcing experience. Nicotine also stimulates neurotransmitters that have a calming or pain-reducing effect.

"There's no shooting—we just make you keep smoking."
© Michael Shaw/The New Yorker Collection/
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Review *Connect* Reflect

LG2 Identify the changes in physical development in young adults.

Review

- How does physical performance peak and then slow down in early adulthood?
- What characterizes health in emerging and early adulthood?
- What are some important things to know about eating and weight?
- What are the benefits of exercise?
- How extensive is substance abuse in young adults? What effects does it have on their lives?

Connect

- Problems with weight in adulthood can often be preceded by problems with weight earlier in life. What are some of the influences on children's eating and exercise behavior in early childhood that you learned about in Chapter 7?

Reflect *Your Own Personal Journey of Life*

- What are or were your emerging adult years from the ages of 18 to 25 like? Do Arnett's five characteristics of emerging adulthood characterize your own emerging adulthood years?

3 Sexuality

LG3 Discuss sexuality in young adults.

Sexual Activity in Emerging Adulthood

Sexually Transmitted Infections

Sexual Orientation and Behavior

Forcible Sexual Behavior and Sexual Harassment

We do not need sex for everyday survival the way we need food and water, but we do need it for the survival of the species. In Chapter 11, we looked at how adolescents develop a sexual identity and become sexually active. What happens to their sexuality in adulthood? Let's examine the sexual activity of Americans and their sexual orientation, as well as some of the problems that can be associated with sexual activity.

SEXUAL ACTIVITY IN EMERGING ADULTHOOD

At the beginning of emerging adulthood (age 18), surveys indicate that slightly more than 60 percent of individuals have experienced sexual intercourse, but by the end of emerging adulthood (age 25), most individuals have had sexual intercourse (Lefkowitz & Gillen, 2006). Also, the average age of marriage in the United States is currently 27 for males and 26 for females (Popenoe & Whitehead, 2006). Thus, emerging adulthood is a time frame during which most individuals are "both sexually active and unmarried" (Lefkowitz & Gillen, 2006, p. 235).

Patterns of heterosexual behavior for males and females in emerging adulthood include the following (Lefkowitz & Gillen, 2006):

- Males have more casual sexual partners, and females report being more selective about their choice of a sexual partner.
- Approximately 60 percent of emerging adults have had sexual intercourse with only one individual in the past year, but compared with young adults in their late twenties and thirties, emerging adults are more likely to have had sexual intercourse with two or more individuals.
- Although emerging adults have sexual intercourse with more individuals than young adults, they have sex less frequently. Approximately 25 percent of emerging adults report having sexual intercourse only a couple of times a year or not at all (Michael & others, 1994).
- Casual sex is more common in emerging adulthood than in young adulthood.

developmental **connection**

Sexuality. Having intercourse in early adolescence is a risk factor in development. Chapter 11, p. 359

SEXUAL ORIENTATION AND BEHAVIOR

The best information we currently have about sexual activity in adults of different ages comes from the 1994 Sex in America survey. In this well-designed, comprehensive study of American adults' sexual patterns, Robert Michael and his colleagues (1994) interviewed more than 3,000 people from 18 to 59 years of age who were randomly selected, a sharp contrast from earlier samples that were based on unrepresentative groups of volunteers.

Heterosexual Attitudes and Behavior Here are some of the key findings from the 1994 Sex in America survey:

- Americans tend to fall into three categories: One-third have sex twice a week or more, one-third a few times a month, and one-third a few times a year or not at all.

What are some characteristics of the sexual activity of emerging adults?

- Married (and cohabiting) couples have sex more often than noncohabiting couples (see Figure 13.5).
- Most Americans do not engage in kinky sexual acts. When asked about their favorite sexual acts, the vast majority (96 percent) said that vaginal sex was "very" or "somewhat" appealing. Oral sex was in third place, after an activity that many have not labeled a sexual act—watching a partner undress.
- Adultery is clearly the exception rather than the rule. Nearly 75 percent of the married men and 85 percent of the married women indicated that they have never been unfaithful.
- Men think about sex far more than women do—54 percent of the men said they think about it every day or several times a day, whereas 67 percent of the women said they think about it only a few times a week or a few times a month.

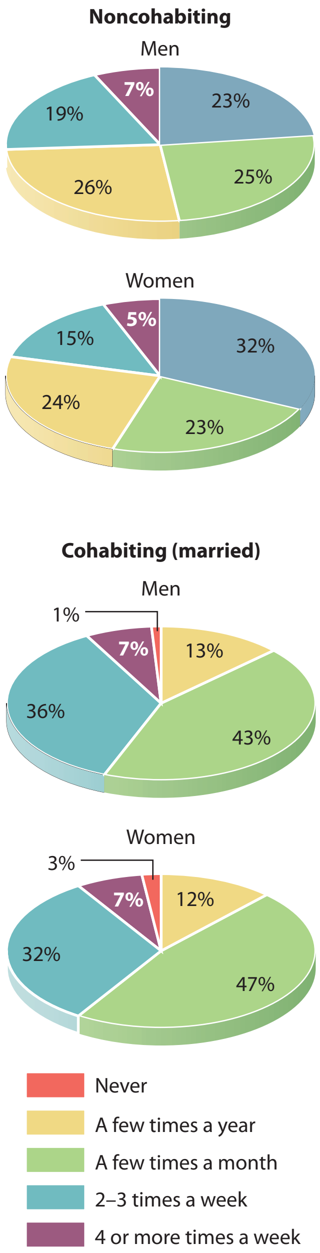


FIGURE **13.5**

THE SEX IN AMERICA SURVEY. The percentages show noncohabiting and cohabiting (married) males' and females' responses to the question "How often have you had sex in the past year?" in a 1994 survey (Michael & others, 1994). *What was one feature of the Sex in America survey that made it superior to most surveys of sexual behavior?*

In sum, one of the most powerful messages in the 1994 survey was that Americans' sexual lives are more conservative than previously believed. Although 17 percent of the men and 3 percent of the women said they have had sex with at least 21 partners, the overall impression from the survey was that sexual behavior is ruled by marriage and monogamy for most Americans.

How extensive are gender differences in sexuality? A recent meta-analysis revealed that men reported having slightly more sexual experience and more permissive attitudes than women for most aspects of sexuality (Petersen & Hyde, 2010). For the following factors, stronger differences were found: Men indicated that they engaged more in masturbation, pornography use, and casual sex, and had more permissive attitudes about casual sex than their female counterparts.

Given all of the media and public attention to the negative aspects of sexuality—such as adolescent pregnancy, sexually transmitted infections, rape, and so on—it is important to underscore that research has strongly supported the role of sexual activity in well-being (Brody, 2010). For example, in a recent Swedish study frequency of sexual intercourse was strongly related to life satisfaction for both men and women (Brody & Costa, 2009).

Sources of Sexual Orientation In the Sex in America survey, 2.7 percent of the men and 1.3 percent of the women reported that they had had same-sex relations in the past year (Michael & others, 1994). Why are some individuals lesbian, gay, or bisexual (LGB) and others heterosexual? Speculation about this question has been extensive (Crooks & Baur, 2008).

Until the end of the nineteenth century, it was generally believed that people were either heterosexual or homosexual. Today, it is more accepted to view sexual orientation not as an either/or proposition, but as a continuum from exclusive male-female relations to exclusive same-sex relations (Hyde & DeLamater, 2011). Some individuals are also *bisexual*, being sexually attracted to people of both sexes.

All people, regardless of their sexual orientation, have similar physiological responses during sexual arousal and seem to be aroused by the same types of tactile stimulation. Investigators typically find no differences between LGBs and heterosexuals in a wide range of attitudes, behaviors, and adjustments (Peplau & Fingerhut, 2007).

Recently, researchers have explored the possible biological basis of same-sex relations. The results of hormone studies have been inconsistent. If gays are given male sex hormones (androgens), their sexual orientation doesn't change. Their sexual desire merely increases. A very early prenatal critical period might influence sexual orientation (Wallen & Hassett, 2009). In the second to fifth months after conception, exposure of the fetus to hormone levels characteristic of females might cause the individual (male or female) to become attracted to males (Ellis & Ames, 1987). If this critical-period hypothesis turns out to be correct, it would

What likely determines an individual's sexual preference?

explain why clinicians have found that sexual orientation is difficult, if not impossible, to modify.

An individual's sexual orientation—same-sex, heterosexual, or bisexual—is most likely determined by a combination of genetic, hormonal, cognitive, and environmental factors (Crooks & Baur, 2011; King, 2011). Most experts on same-sex relations point out that no one factor alone causes sexual orientation and that the relative weight of each factor can vary from one individual to the next.

Researchers have examined the role of genes as a factor in sexual orientation by using twins to estimate the genetic and environmental contributions to sexual orientation. A recent Swedish study of almost 4,000 twins demonstrated that only about 35 percent of the variation in homosexual behavior in men and 19 percent in women were explained by genetic differences (Langstrom & others, 2010). This result indicates that although genes likely play a role in sexual orientation, they are not as strong in explaining sexuality as they are for other characteristics, such as intelligence (King, 2011).

developmental **connection**

Research Methods. A twin study focuses on the behavioral similarity of identical twins compared to fraternal twins. Chapter 2, p. 71

Attitudes and Behavior of Lesbians and Gays Many gender differences that appear in heterosexual relationships occur in same-sex relationships (Cohler, 2009; Diamond & Savin-Williams, 2009). For example, like heterosexual women, lesbians have fewer sexual partners than gay men, and lesbians have less permissive attitudes about casual sex outside a primary relationship than gay men (Peplau & Fingerhut, 2007).

How can lesbians and gays adapt to a world in which they are a minority? According to psychologist Laura Brown (1989), lesbians and gays experience life as a minority in a dominant, majority culture. For lesbians and gays, developing a *bicultural identity* creates new ways of defining themselves. Brown maintains that lesbians and gays adapt best when they don't define themselves in polarities, such as trying to live in an encapsulated lesbian or gay world completely divorced from the majority culture or completely accepting the dictates and bias of the majority culture. Balancing the demands of the two cultures—the minority lesbian/gay culture and the majority heterosexual culture—can often lead to more effective coping for lesbians and gays, says Brown.

A special concern involving sexual minority individuals are the hate crimes and stigma-related experiences they encounter (Cohler, 2009). In a recent study,

STI	Description/cause	Incidence	Treatment
Gonorrhea	Commonly called the "drip" or "clap." Caused by the bacterium *Neisseria gonorrhoeae*. Spread by contact between infected moist membranes (genital, oral-genital, or anal-genital) of two individuals. Characterized by discharge from penis or vagina and painful urination. Can lead to infertility.	500,000 cases annually in U.S.	Penicillin, other antibiotics
Syphilis	Caused by the bacterium *Treponema pallidum*. Characterized by the appearance of a sore where syphilis entered the body. The sore can be on the external genitals, vagina, or anus. Later, a skin rash breaks out on palms of hands and bottom of feet. If not treated, can eventually lead to paralysis or even death.	100,000 cases annually in U.S.	Penicillin
Chlamydia	A common STI named for the bacterium *Chlamydia trachomatis*, an organism that spreads by sexual contact and infects the genital organs of both sexes. A special concern is that females with chlamydia may become infertile. It is recommended that adolescent and young adult females have an annual screening for this STI.	About 3 million people in U.S. annually.	Antibiotics
Genital herpes	Caused by a family of viruses with different strains. Involves an eruption of sores and blisters. Spread by sexual contact.	One of five U.S. adults	No known cure but antiviral medications can shorten outbreaks
AIDS	Caused by a virus, the human immunodeficiency virus (HIV), which destroys the body's immune system. Semen and blood are the main vehicles of transmission. Common symptoms include fevers, night sweats, weight loss, chronic fatigue, and swollen lymph nodes.	More than 300,000 cumulative cases of HIV virus in U.S. 25–34-year-olds; epidemic incidence in sub-Saharan countries	New treatments have slowed the progression from HIV to AIDS; no cure
Genital warts	Caused by the human papillomavirus, which does not always produce symptoms. Usually appear as small, hard painless bumps in the vaginal area, or around the anus. Very contagious. Certain high-risk types of this virus cause cervical cancer and other genital cancers. May recur despite treatment. A new HPV preventive vaccine, Gardasil, has been approved for girls and women 9–26 years of age.	About 5.5 million new cases annually; considered the most common STI in the U.S.	A topical drug, freezing, or surgery

FIGURE **13.6**
SEXUALLY TRANSMITTED INFECTIONS

approximately 20 percent of sexual minority adults reported that they had experienced a person or property crime related to their sexual orientation and about 50 percent said they had experienced verbal harassment (Herek, 2009).

SEXUALLY TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs) are diseases that are primarily contracted through sex—intercourse as well as oral-genital and anal-genital sex. STIs affect about one of every six U.S. adults (National Center for Health Statistics, 2010c). Among the most prevalent STIs are bacterial infections (such as gonorrhea, syphilis, and chlamydia), and STIs caused by viruses—genital herpes, genital warts, and HIV, which can lead to AIDS. Figure 13.6 describes several sexually transmitted infections.

No single STI has had a greater impact on sexual behavior, or created more public fear in the last several decades, than infection with the human immunodeficiency virus (HIV). HIV is a sexually transmitted infection that destroys the body's immune system. Once infected with HIV, the virus breaks down and overpowers the immune system, which leads to acquired immune deficiency syndrome (AIDS). An individual sick with AIDS has such a weakened immune system that a common cold can be life threatening.

Through 2007, 580,146 cases of AIDS in 20- to 39-year-olds had been reported in the United States (National Center for Health Statistics, 2010b). In 2007, male-male sexual contact continued to be the most frequent AIDS transmission category (National Center for Health Statistics, 2010b). Because of education and the

sexually transmitted infections (STIs) Diseases that are contracted primarily through sex.

connecting with careers

Pat Hawkins, Community Psychologist and Director of an HIV/AIDS Clinic

Pat Hawkins is the associate executive director for policy and external affairs of the Whitman-Walker Clinic in Washington, DC, helping HIV and AIDS patients. She came to the clinic as a volunteer in 1983, just after HIV/AIDS exploded into an epidemic. Hawkins says that she would not do anything else but community work. "Nothing gets you engaged so fast as getting involved," she comments. "We often keep the academic world separate from the real world, and we desperately need psychologists' skills in the real world." Hawkins was a double major in psychology and sociology as an undergraduate and then went on to obtain her Ph.D. in community psychology.

Pat Hawkins counseling an AIDS patient.

development of more effective drug treatments, deaths due to HIV/AIDS have begun to decline in the United States (National Center for Health Statistics, 2010b). To read about the background and work of one individual who counsels HIV/AIDS patients, see *Connecting With Careers*.

Globally, the total number of individuals living with HIV was 33 million in 2007 with 22 million of these individuals with HIV living in sub-Saharan Africa (UNAIDS, 2008). Approximately half of all new HIV infections around the world occur in the 15- to 24-year-old age category (Campbell, 2009).

The good news is that since 2001, there has been considerable progress in delivering HIV services to millions of people around the world. By the end of 2007, the annual number of new HIV infections had decreased to 2.7 million from 3 million in 2005 (UNAIDS, 2009).

What are some good strategies for protecting against HIV and other sexually transmitted infections? They include:

- *Knowing your and your partner's risk status.* Anyone who has had previous sexual activity with another person might have contracted an STI without being aware of it. Spend time getting to know a prospective partner before you have sex. Use this time to inform the other person of your STI status and inquire about your partner's. Remember that many people lie about their STI status.
- *Obtaining medical examinations.* Many experts recommend that couples who want to begin a sexual relationship should have a medical checkup to rule out STIs before they engage in sex. If cost is an issue, contact your campus health service or a public health clinic.
- *Having protected, not unprotected, sex.* When correctly used, latex condoms help to prevent many STIs from being transmitted. Condoms are most effective in preventing gonorrhea, syphilis, chlamydia, and HIV. They are less effective against the spread of herpes.
- *Not having sex with multiple partners.* One of the best predictors of getting an STI is having sex with multiple partners. Having more than one sex partner elevates the likelihood that you will encounter an infected partner.

FORCIBLE SEXUAL BEHAVIOR AND SEXUAL HARASSMENT

Too often, sex involves the exercise of power. Here, we will briefly look at three of the problems that may result: two types of rape and sexual harassment.

Rape **Rape** is forcible sexual intercourse with a person who does not give consent. Legal definitions of rape differ from state to state. For example, in some states husbands are not prohibited from forcing their wives to have intercourse, although this has been challenged in several of those states.

Because victims may be reluctant to suffer the consequences of reporting rape, the actual incidence is not easily determined (Littleton & Henderson, 2009; Walsh & others, 2010). Nearly 200,000 rapes are reported each year in the United States. Although most victims of rape are women, rape of men does occur (Anderson & Quinn, 2008). Men in prisons are especially vulnerable to rape, usually by heterosexual males who use rape as a means of establishing their dominance and power.

Why does rape of women occur so often in the United States? Among the causes given are that males are socialized to be sexually aggressive, to regard women as inferior beings, and to view their own pleasure as the most important objective in sexual relations (Beech, Ward, & Fisher, 2006). Researchers have found that male rapists share the following characteristics: aggression enhances their sense of power or masculinity; they are angry at women in general; and they want to hurt and humiliate their victims (Strong & others, 2008). A recent study revealed that a higher level of men's sexual narcissism (assessed by these factors: sexual exploitation, sexual entitlement, low sexual empathy, and sexual skill) was linked to a greater likelihood that they would engage in sexual aggression (Widman & McNulty, 2010).

Rape is a traumatic experience for the victims and those close to them (Jordan, Campbell, & Follingstad, 2010). As victims strive to get their lives back to normal, they may experience depression, fear, anxiety, and increased substance use for months or years (Herrera & others, 2006). Many victims make changes in their lives—such as moving to a new apartment or refusing to go out at night. Recovery depends on the victim's coping abilities, psychological adjustments prior to the assault, and social support. Parents, a partner, and others close to the victim can provide important support for recovery, as can mental health professionals (Littleton, 2010).

An increasing concern is **date or acquaintance rape,** which is coercive sexual activity directed at someone with whom the victim is at least casually acquainted (Bouffard & Bouffard, 2010). In one estimate, two-thirds of college freshman women report having been date raped or having experienced an attempted date rape at least once (Watts & Zimmerman, 2002). About two-thirds of college men admit that they fondle women against their will, and half admit to forcing sexual activity.

A number of college and universities describe the *red zone* as a period of time early in the first year of college when women are at especially high risk for unwanted sexual experiences. A recent study revealed that first-year women were more at risk for unwanted sexual experiences, especially early in the fall term, than second-year women (Kimble & others, 2008). Exactly how prevalent are sexual assaults on college campuses? To find out, see *Connecting Through Research*.

What are some characteristics of acquaintance rape in colleges and universities?

Sexual Harassment Sexual harassment is a manifestation of power of one person over another. It takes many forms—from inappropriate sexual remarks and physical contact (patting, brushing against one's body) to blatant propositions and sexual assaults. Millions of women experience sexual harassment each year in work and educational settings (Best & others, 2010; Hynes & Davis, 2009). Sexual harassment of men by women also occurs but to a far lesser extent than sexual harassment of women by men.

rape Forcible sexual intercourse with a person who does not consent to it.

date or acquaintance rape Coercive sexual activity directed at someone with whom the perpetrator is at least casually acquainted.

connecting through research

How Prevalent Are Sexual Assaults on College Campuses?

A major study that focused on campus sexual assault involved a phone survey of 4,446 women attending two- or four-year colleges (Fisher, Cullen, & Turner, 2000). Sexual victimization was measured in a two-stage process. First, a series of screening questions were asked to determine if the respondent had experienced an act that might possibly be a victimization. Second, if the respondent answered "yes," the respondent was asked detailed questions about the incident, such as the type of unwanted contact and the means of coercion. In addition, respondents were asked about other aspects of their lives, including their lifestyles, routine activities, living arrangements, and prior sexual victimization.

Slightly less than 3 percent said that they had experienced either a rape or an attempted rape during the academic year. About 1 of 10 college women said that they had experienced rape in their lifetime. Unwanted or uninvited sexual contacts were widespread, with more than one-third of the college women reporting these incidents. As shown in Figure 13.7, in this study, most women (about 9 of 10) knew the person who sexually victimized them. Most of the women attempted to take protective actions against their assailants but were then reluctant to report the victimization to the police for a number of reasons (such as embarrassment, not clearly understanding the legal definition of rape, or not wanting to define someone they knew who victimized them as a rapist). Several factors were associated with sexual victimization: living on campus, being unmarried, getting drunk frequently, and experiencing prior sexual victimization. The majority of rapes occurred in living quarters.

In addition, this research examined a form of sexual victimization that has been studied infrequently: stalking. Thirteen percent of the female students said they had been stalked since the school year began. As with other sexual victimizations, 80 percent knew their stalkers, who most often were boyfriends (42 percent) or classmates (24 percent). Stalking incidents lasted an average of 60 days.

Given the prevalence of sexual assault on college campuses and the frequency with which those assaults involve perpetrators the victims know, it is clear that more research needs to be dedicated to effective intervention strategies for both young men and women. In the past, too often, the responsibility of prevention was placed on the would-be victim's behavior. While those sorts of strategies are not unhelpful, prevention strategies that target the behavior of the would-be rapist might get closer to the root of the problem.

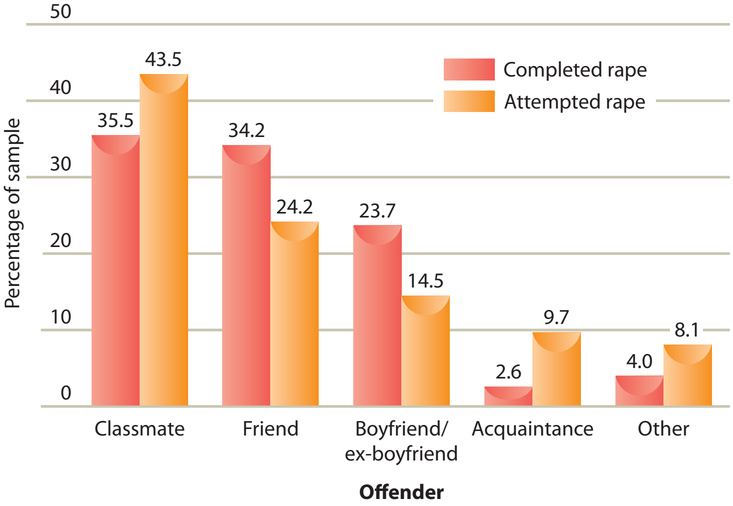


FIGURE **13.7**

RELATIONSHIP BETWEEN VICTIM AND OFFENDER IN COMPLETED AND ATTEMPTED RAPES OF COLLEGE WOMEN. In a phone survey of college women, slighty less than 3 percent of the women said they had experienced a rape or attempted rape during the academic year (Fisher, Cullen, & Turner, 2000). The percentages shown here indicate the relationship between the victim and the offender. *What were some possible advantages and disadvantages of using a phone survey rather than face-to-face interviews to conduct this study?*

In a recent survey of 2,000 college women, 62 percent reported that they had experienced sexual harassment while attending college (American Association of University Women, 2006). Most of the college women said that the sexual harassment involved noncontact forms such as crude jokes, remarks, and gestures. However, almost one-third said that the sexual harassment was physical in nature. Sexual harassment can result in serious psychological consequences for the victim. Sexual harassment is a manifestation of power of one person over another. The elimination of such exploitation requires the development of work and academic environments that provide equal opportunities to develop a career and obtain education in a climate free of sexual harassment (Das, 2009; Hynes & Davis, 2009).

Review *Connect* Reflect

LG3 Discuss sexuality in young adults.

Review

- What characterizes the sexual activity of emerging adults?
- What is the nature of heterosexuality and same-sex sexual orientation?
- What are sexually transmitted infections? What are some important things to know about AIDS?
- What is rape? Date or acquaintance rape? What are the effects of forcible sexual behavior and sexual harassment?

Connect

- As you learned in this section, sexual assault is connected with aggression in males. In Chapter 8, what did you read was one way in which children learn to behave aggressively?

Reflect *Your Own Personal Journey of Life*

- How would you describe your sexual experiences during emerging adulthood? How similar or dissimilar are they to the way sexuality in emerging adulthood was described in this section?

4 Cognitive Development

LG4 Characterize cognitive changes in early adulthood.

Cognitive Stages

Creativity

Are there changes in cognitive performance during these years? To explore the nature of cognition in early adulthood, we will focus on issues related to cognitive stages and creative thinking.

COGNITIVE STAGES

Are young adults more advanced in their thinking than adolescents are? Let's examine what Jean Piaget and others have said about this intriguing question.

developmental **connection**

Cognitive Theory. Adolescent cognition also includes adolescent egocentrism. Chapter 11, p. 371

Piaget's View Piaget concluded that an adolescent and an adult think qualitatively in the same way. That is, Piaget argued that at approximately 11 to 15 years of age, adolescents enter the formal operational stage, which is characterized by more logical, abstract, and idealistic thinking than the concrete operational thinking of 7- to 11-year-olds. Piaget did stress that young adults are more *quantitatively* advanced in their thinking in the sense that they have more knowledge than adolescents. He also reasoned, as do information-processing psychologists, that adults especially increase their knowledge in a specific area, such as a physicist's understanding of physics or a financial analyst's knowledge about finance. According to Piaget, however, formal operational thought is the final stage in cognitive development, and it characterizes adults as well as adolescents.

Some developmentalists theorize it is not until adulthood that many individuals consolidate their formal operational thinking. That is, they may begin to plan and hypothesize about intellectual problems in adolescence, but they become more systematic and sophisticated at this as young adults. Nonetheless, even many adults do not think in formal operational ways (Keating, 2004).

Realistic and Pragmatic Thinking Some developmentalists propose that as young adults move into the world of work, their way of thinking does change. One idea is that as they face the constraints of reality, which work promotes, their idealism decreases (Labouvie-Vief, 1986).

A related change in thinking was proposed that concludes it is unlikely that adults go beyond the powerful methods of scientific thinking characteristic of the formal operational stage (Schaie & Willis, 2000). However, adults do progress beyond adolescents in their use of intellect. For example, in early adulthood individuals often switch from acquiring knowledge to applying knowledge as they pursue success in their work (Schaie & Willis, 2000).

What are some ways that young adults might think differently than adolescents?

Reflective and Relativistic Thinking William Perry (1999) also described changes in cognition that take place in early adulthood. He said that adolescents often view the world in terms of polarities—right/wrong, we/they, or good/bad. As youth age into adulthood, they gradually move away from this type of absolutist thinking as they become aware of the diverse opinions and multiple perspectives of others. Thus, in Perry's view, the absolutist, dualistic thinking of adolescence gives way to the reflective, relativistic thinking of adulthood. Other developmentalists also observe that reflective thinking is an important indicator of cognitive change in young adults (Fischer & Bidell, 2006).

Expanding on Perry's view, Gisela Labouvie-Vief (2006) recently proposed that the increasing complexity of cultures in the past century has generated a greater need for more reflective, complex thinking that takes into account the changing nature of knowledge and challenges. She also emphasizes that the key aspects of cognitive development in emerging adulthood include deciding on a particular worldview, recognizing that the worldview is subjective, and understanding that diverse worldviews should be acknowledged. In her perspective, considerable individual variation characterizes the thinking of emerging adults, with the highest level of thinking attained by only some. She argues that the level of education emerging adults achieve especially influences how likely they will maximize their cognitive potential.

Is There a Fifth, Postformal Stage? Some theorists have pieced together cognitive changes in young adults and proposed a new stage of cognitive development, **postformal thought,** which is qualitatively different from Piaget's formal operational thought (Sinnott, 2003). Postformal thought involves understanding that the correct answer to a problem requires reflective thinking and can vary from one situation to another, and that the search for truth is often an ongoing, never-ending process (Kitchener, King, & Deluca, 2006). Postformal thought also includes the belief that solutions to problems need to be realistic and that emotion and subjective factors can influence thinking.

What is postformal thought like in practice? As young adults engage in more reflective judgment when solving problems, they might think deeply about many aspects of politics, their career and work, relationships, and other areas of life (Labouvie-Vief & Diehl, 1999). They might understand that what might be the best solution to a problem at work (with a coworker or boss) might not be the best solution at home (with a romantic partner). Many young adults also become more skeptical about there being a single truth and often are not willing to accept an answer as final. They also often recognize that thinking can't just be abstract but rather has to be realistic and pragmatic. And many young adults understand that emotions can play a role in thinking—for example, that they are likely to think more clearly when they are in a calm and collected state than when they are angry and highly aroused.

How strong is the evidence for a fifth, postformal stage of cognitive development? Researchers have found that young adults are more likely to engage in this postformal thinking than adolescents are (Commons & Bresette, 2006). But critics

developmental **connection**

Cognitive Theory. Another aspect of cognition that some developmental psychologists conclude advances through adulthood is wisdom. Chapter 18, p. 568

postformal thought A form of thought that is qualitatively different from Piaget's formal operational thought. It involves understanding that the correct answer to a problem can require reflective thinking, that the correct answer can vary from one situation to another, and that the search for truth is often an ongoing, never-ending process. It also involves the belief that solutions to problems need to be realistic and that emotion and subjective factors can influence thinking.

argue that research has yet to document that postformal thought is a qualitatively more advanced stage than formal operational thought.

CREATIVITY

Early adulthood is a time of great creativity for some people. At the age of 30, Thomas Edison invented the phonograph, Hans Christian Andersen wrote his first volume of fairy tales, and Mozart composed *The Marriage of Figaro*. One early study of creativity found that individuals' most creative products were generated in their thirties and that 80 percent of the most important creative contributions were completed by age 50 (Lehman, 1960).

More recently, researchers have found that creativity does peak in adulthood and then decline, but that the peak often occurs in the forties. However, qualifying any conclusion about age and creative accomplishments are (1) the magnitude of the decline in productivity, (2) contrasts across creative domains, and (3) individual differences in lifetime output (Simonton, 1996).

Even though a decline in creative contributions is often found in the fifties and later, the decline is not as great as commonly thought. An impressive array of creative accomplishments occur in late adulthood. One of the most remarkable examples of creative accomplishment in late adulthood can be found in the life of Henri Chevreul. After a distinguished career as a physicist, Chevreul switched fields in his nineties to become a pioneer in gerontological research. He published his last research paper just a year prior to his death at the age of 103!

Any consideration of decline in creativity with age requires consideration of the field of creativity involved. In such fields as philosophy and history, older adults often show as much creativity as when they were in their thirties and forties. By

connecting development to life

Flow and Other Strategies for Living a More Creative Life

Mihaly Csikszentmihalyi (pronounced ME-high CHICK-sent-me-high-ee) has recommended a number of strategies for becoming more creative. Csikszentmihalyi (1995) interviewed 90 leading figures in art, business, government, education, and science to learn how creativity works. He discovered that creative people regularly experience a state he calls *flow*, a heightened state of pleasure experienced when we are engaged in mental and physical challenges that absorb us. Csikszentmihalyi (2000) points out that everyone is capable of achieving flow. Based on his interviews with some of the most creative people in the world, the first step toward a more creative life is cultivating your curiosity and interest. How can you do this?

- *Try to be surprised by something every day.* Maybe it is something you see, hear, or read about. Become absorbed in a lecture or a book. Be open to what the world is telling you. Life is a stream of experiences. Swim widely and deeply in it, and your life will be richer.
- *Try to surprise at least one person every day.* In a lot of things you do, you have to be predictable and patterned. Do something different for a change. Ask a question you normally would not ask. Invite someone to go to a show or a museum you never have visited.
- *Write down each day what surprised you and how you surprised others.* Most creative people keep a diary, notes, or lab records to ensure that their experience is not fleeting or forgotten. Start with a specific task. Each evening record the most surprising event that occurred that day and your most surprising action. After a few

Mihaly Csikszentmihalyi, in the setting where he gets his most creative ideas. *When and where do you get your most creative thoughts?*

connecting development to life

(continued)

days, reread your notes and reflect on your past experiences. After a few weeks, you might see a pattern of interest emerging in your notes, one that might suggest an area you can explore in greater depth.

- *When something sparks your interest, follow it.* Usually when something captures your attention, it is short-lived—an idea, a song, a flower. Too often we are too busy to explore the idea, song, or flower further. Or we think these areas are none of our business because we are not experts about them. Yet the world is our business. We can't know which part of it is best suited to our interests until we make a serious effort to learn as much about as many aspects of it as possible.
- *Wake up in the morning with a specific goal to look forward to.* Creative people wake up eager to start the day. Why? Not necessarily because they are cheerful, enthusiastic types but because they know that there is something meaningful to accomplish each day, and they can't wait to get started.
- *Spend time in settings that stimulate your creativity.* In Csikszentmihalyi's (1995) research, he gave people an electronic pager and beeped them randomly at different times of the day. When he asked them how they felt, they reported the highest levels of creativity when walking, driving, or swimming. I (your author) do my most creative thinking when I'm jogging. These activities are semiautomatic in that they take a certain amount of attention while leaving some time free to make connections among ideas.

Can the strategies for stimulating creative thinking in children found in the Connecting Development to Life interlude in Chapter 9 also be used by adults? How do the strategies discussed in Chapter 9 compare to those discussed here?

contrast, in such fields as lyric poetry, abstract math, and theoretical physics, the peak of creativity is often reached in the twenties or thirties.

There also is extensive individual variation in the lifetime output of creative individuals. Typically, the most productive creators in any field are far more prolific than their least productive counterparts. The contrast is so extreme that the top 10 percent of creative producers frequently account for 50 percent of the creative output in a particular field. For instance, only 16 composers account for half of the music regularly performed in the classical repertoire.

Can you make yourself more creative? To read further about strategies for becoming more creative, see *Connecting Development to Life*.

developmental **connection**

Creativity. What strategies are likely to enhance children's creative thinking? Chapter 9, p. 293

Review *Connect* Reflect

LG4 Characterize cognitive changes in early adulthood.

Review

- What changes in cognitive development in young adults have been proposed?
- Does creativity decline in adulthood? How can people lead more creative lives?

Connect

- In this section, postformal thought was characterized in part by a belief that emotion and subjective factors influence thinking. Why are adolescents not typically capable of this kind of thought?

Reflect *Your Own Personal Journey of Life*

- If you are in emerging adulthood, what do you think are the most important cognitive changes that have taken place so far in the transition period? If you are older, reflect on your emerging adult years and describe what cognitive changes occurred during this time?

5 Careers and Work

LG5 Explain the key dimensions of career and work in early adulthood.

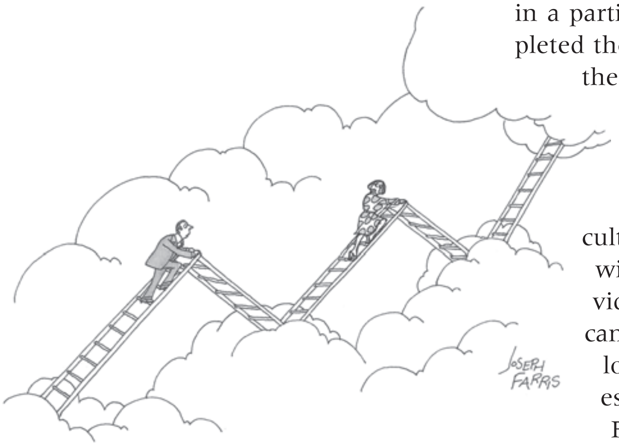
- Developmental Changes
- Finding a Path to Purpose
- Monitoring the Occupational Outlook
- The Impact of Work
- Diversity in the Workplace

Earning a living, choosing an occupation, establishing a career, and developing in a career—these are important themes of early adulthood. What are some of the factors that go into choosing a job or career, and how does work typically affect the lives of young adults?

DEVELOPMENTAL CHANGES

Many children have idealistic fantasies about what they want to be when they grow up. For example, many young children want to be superheroes, sports stars, or movie stars. In the high school years, they often have begun to think about careers on a somewhat less idealistic basis. In their late teens and early twenties, their career decision making has usually turned more serious as they explore different career possibilities and zero in on the career they want to enter. In college, this often means choosing a major or specialization that is designed to lead to work in a particular field. By their early and mid-twenties, many individuals have completed their education or training and started to enter a full-time occupation. From the mid-twenties through the remainder of early adulthood, individuals often seek to establish their emerging career in a particular field. They may work hard to move up the career ladder and improve their financial standing.

Phyllis Moen (2009a) recently described the *career mystique*, ingrained cultural beliefs that engaging in hard work for long hours through adulthood will produce a path to status, security, and happiness. That is, many individuals have an ideal concept of a career path toward achieving the American dream of upward mobility through occupational ladders. However, the lockstep career mystique has never been a reality for many individuals, especially ethnic minority individuals, women, and poorly educated adults. Further, the career mystique has increasingly become a myth for many individuals in middle-income occupations as global outsourcing of jobs and the 2007–2009 recession have meant reduced job security for millions of Americans.



"Did you think the ladder of success would be straight up?"

© Joseph Farris/The New Yorker Collection/www.cartoonbank.com

FINDING A PATH TO PURPOSE

In Chapter 11, we discussed William Damon's (2008) view that he proposed in his book *The Path to Purpose: Helping Our Children Find Their Calling in Life*, and how it is linked to identity development. Here we expand on his view and explore how purpose is a missing ingredient in many adolescents' and emerging adults' achievement and career development. Too many youth drift and aimlessly go through their high school and college years, Damon says, engaging in behavior that places them at risk for not fulfilling their potential and not finding a life pursuit that energizes them.

In interviews with 12- to 22-year-olds, Damon found that only about 20 percent had a clear vision of where they want to go in life, what they want to achieve, and why. The largest percentage—about 60 percent—had engaged in some potentially purposeful activities, such as service learning or fruitful discussions with a career counselor—but they still did not have a real commitment or any reasonable plans

developmental **connection**

Identity. A concern of Damon's is that many youth aren't moving toward any identity resolution, but rather become immersed in a directionless shift. Chapter 12, p. 386

for reaching their goals. And slightly more than 20 percent expressed no aspirations and in some instances said they didn't see any reason to have aspirations.

Damon concludes that most teachers and parents communicate the importance of such goals as studying hard and getting good grades, but rarely discuss what the goals might lead to—the purpose for studying hard and getting good grades. Damon emphasizes that too often students focus only on short-term goals and don't explore the big, long-term picture of what they want to do in life. These interview questions that Damon (2008, p. 135) has used in his research are good springboards for getting individuals to reflect on their purpose:

> What's most important to you in your life?
> Why do you care about those things?
> Do you have any long-term goals?
> Why are these goals important to you?
> What does it mean to have a good life?
> What does it mean to be a good person?
> If you were looking back on your life now,
> how would you like to be remembered?

Hari Prabhakar (*in rear*) at a screening camp in India that he created as part of his Tribal India Health Foundation. Hari reflects William Damon's concept of finding a path to purpose. His ambition is to become an international health expert. Hari graduated from Johns Hopkins University in 2006 with a double major in public health and writing. A top student (3.9 GPA), he took the initiative to pursue a number of activities outside the classroom, in the health field. As he made the transition from high school to college, Hari created the Tribal India Health Foundation (www.tihf.org), which provides assistance in bringing low-cost health care to rural areas in India. Juggling his roles as a student and as the foundation's director, Hari spent about 15 hours a week leading Tribal India Health throughout his four undergraduate years. In describing his work, Hari said (Johns Hopkins University, 2006):

> I have found it very challenging to coordinate the international operation. . . . It takes a lot of work, and there's not a lot of free time. But it's worth it when I visit our patients and see how they and the community are getting better.

Sources: Johns Hopkins University (2006); Prabhakar (2007).

MONITORING THE OCCUPATIONAL OUTLOOK

As you explore the type of work you are likely to enjoy and in which you can succeed, it is important to be knowledgeable about different fields and companies. Occupations may have many job openings one year but few in another year as economic conditions change. Thus, it is critical to keep up with the occupational outlook in various fields. An excellent source for doing this is the U.S. government's *Occupational Outlook Handbook, 2010–2011* (2010) which is revised every two years.

According to the 2010–2011 handbook, service industries, especially health services, professional and business services, and education are projected to account for the most new jobs in the next decade. Projected job growth varies widely by education requirements. Jobs that require a college degree are expected to grow the fastest. Most of the highest-paying occupations require a college degree.

developmental **connection**

Work. The middle-aged worker faces a number of challenges in the 21st century. Chapter 15, p. 493

THE IMPACT OF WORK

Work defines people in fundamental ways (Blustein, 2008). It is an important influence on their financial standing, housing, the way they spend their time, where they live, their friendships, and their health (Hodson, 2009). Some people define their identity through their work. Work also creates a structure and rhythm to life that is often missed when individuals do not work for an extended period. When unable to work, many individuals experience emotional distress and low self-esteem.

Most individuals spend about one-third of their lives at work. In one survey, 35 percent of Americans worked 40 hours a week, but 18 percent worked 51 hours or more per week (Center for Survey Research at the University of Connecticut, 2000). Only 10 percent worked less than 30 hours a week.

An important consideration regarding work is how stressful it is (Burgard, 2009; Fernandez & others, 2010). A recent national survey of U.S. adults revealed that 55 percent

What are some characteristics of work settings linked with employees' stress?

indicated they were less productive because of stress (American Psychological Association, 2007). In this study, 52 percent reported that they considered or made a career decision, such as looking for a new job, declining a promotion, or quitting a job, because of stress in the workplace (American Psychological Association, 2007). In this survey, main sources of stress included low salaries (44 percent), lack of advancement opportunities (42 percent), uncertain job expectations (40 percent), and long hours (39 percent).

Many adults have changing expectations about work, yet employers often aren't meeting their expectations (Grzywacz, 2009; Lavoie-Tremblay & others, 2010; Moen, 2009a, b). For example, current policies and practices were designed for a single breadwinner (male) workforce and an industrial economy, making these policies and practices out of step with a workforce of women and men, and of single-parent and dual earners. Many workers today want flexibility and greater control over the time and timing of their work, and yet most employers offer little flexibility, even though policies like flextime may be "on the books."

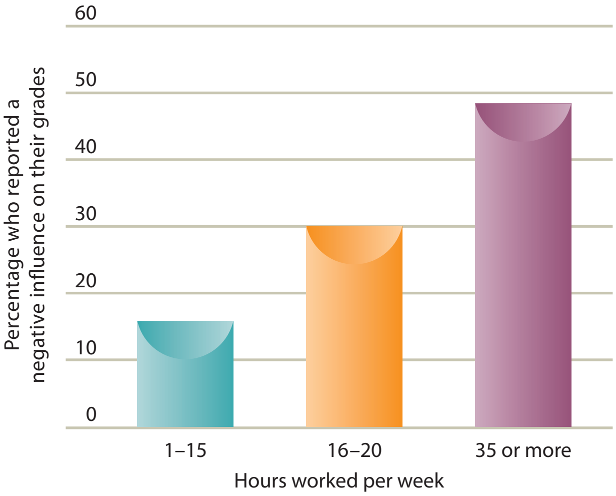


FIGURE **13.8**

THE RELATION OF HOURS WORKED PER WEEK IN COLLEGE TO GRADES. Among students working to pay for school expenses, 16 percent of those working 1 to 15 hours per week reported that working negatively influenced their grades (National Center for Education Statistics, 2002). Thirty percent of college students who worked 16 to 20 hours a week said the same, as did 48 percent who worked 35 hours or more per week.

Work During College The percentage of full-time U.S. college students who were employed increased from 34 percent in 1970 to 46 percent in 2006 (down from a peak of 52 percent in 2000) (National Center for Education Statistics, 2008c). In this recent survey, 81 percent of part-time U.S. college students were employed.

Working can pay or help offset some costs of schooling, but working also can restrict students' opportunities to learn. For those who identified themselves primarily as students, one national study found that as the number of hours worked per week increased, their grades suffered (National Center for Education Statistics, 2002) (see Figure 13.8). Thus, college students need to carefully examine whether the number of hours they work is having a negative impact on their college success.

Of course, jobs also can contribute to your education. More than 1,000 colleges in the United States offer *cooperative (co-op) programs*, which are paid apprenticeships in a field that you are interested in pursuing. (You may not be permitted to participate in a co-op program until your junior year.) Other useful opportunities for working while going to college include internships and part-time or summer jobs relevant to your field of study. Participating in these work experiences can be a key factor in whether you land the job you want when you graduate.

The economic recession that hit in 2007 resulted in millions of Americans losing their jobs, such as the individuals in line here waiting to apply for unemployment benefits in June, 2009, in Chicago. *What are some of the potential negative outcomes of the stress caused by job loss?*

Unemployment Unemployment produces stress regardless of whether the job loss is temporary, cyclical, or permanent (Perrucci & Perrucci, 2009; Romans, Cohen, & Forte, 2010). Banking financial problems and the recession toward the end of the first decade of the 21st century has produced very high unemployment rates, especially in the United States. Researchers have found that unemployment is related to physical problems (such as heart attack and stroke), mental problems (such as depression and anxiety), marital difficulties, and homicide (Gallo & others, 2006). A 15-year longitudinal study of more than 24,000 adults found that life satisfaction dropped considerably following unemployment and increased after becoming reemployed but did not completely return to the life satisfaction level previous to being unemployed (Lucas & others, 2004). A recent study also revealed that immune system functioning declined with unemployment and increased with new employment (Cohen & others, 2007).

Stress comes not only from a loss of income and the resulting financial hardships but also from decreased self-esteem (Audhoe & others, 2010; Beutel & others, 2010). Individuals who cope best with unemployment have financial resources to rely on, often savings or the earnings of other family members. The support of understanding, adaptable family members also helps individuals cope with unemployment. Job counseling and self-help groups can provide practical advice on job searching, résumés, and interviewing skills, and also give emotional support.

Dual-Earner Couples Dual-earner couples may have special problems finding a balance between work and the rest of life (Eby, Maher, & Butts, 2010; Moen, 2009b; Setterson & Ray, 2010). If both partners are working, who cleans up the house or calls the repairman or takes care of the other endless details involved in maintaining a home? If the couple has children, who is responsible for being sure that the children get to school or to piano practice, who writes the notes to approve field trips or meets the teacher or makes the dental appointments?

Although single-earner married families still make up a sizeable minority of families, the two-earner couple has increased considerably in recent decades. As more U.S. women worked outside the home, the division of responsibility for work and family changed: (1) U.S. husbands are taking increased responsibility for maintaining the home; (2) U.S. women are taking increased responsibility for breadwinning; (3) U.S. men are showing greater interest in their families and parenting.

Many jobs have been designed for single earners, usually a male breadwinner, without family responsibilities and the realities of people's actual lives. Consequently, many dual-earner couples engage in a range of adaptive strategies to coordinate their work and manage the family side of the work-family equation (Moen, 2009b). Researchers have found that even though couples may strive for gender equality in dual-earner families, gender inequalities still persist (Cunnningham, 2009). For example, women still do not earn as much as men in the same jobs, and this inequity means that gender divisions in how much time each partner spends in paid work, homemaking, and caring for children continue. Thus, dual-earner career decisions often are made in favor of men's greater earning power and women spending more time than men in homemaking and caring for children (Moen, 2009b).

DIVERSITY IN THE WORKPLACE

The workplace is becoming increasingly diverse (*Occupational Outlook Handbook, 2008–2009*). Whereas at one time few women were employed outside the home, in developed countries women have increasingly entered the labor force. A recent projection indicates that women's share of the U.S. labor force will increase faster than men's share through 2018 (*Occupational Outlook Handbook, 2010–2011*). In the United States, more than one-fourth of all lawyers, physicians, computer scientists, and chemists today are females.

Ethnic diversity also is increasing in the workplace in every developed country except France. In the United States, between 1980 and 2004, the percentage of Latinos and Asian Americans more than doubled in the workplace, a trend that is expected to continue (*Occupational Outlook Handbook, 2010–2011*). Latinos are projected to constitute a larger percentage of the labor force than African Americans by 2018, growing from 13 percent in 2006 to 17.6 percent in 2018 (*Occupational Outlook Handbook, 2010–2011*). The increasing diversity in the workplace requires a sensitivity to cultural differences, and the cultural values that workers bring to a job need to be recognized and appreciated (Fassinger, 2008).

How has the diversity of the workplace changed in recent years?

Despite the increasing diversity in the workplace, women and ethnic minorities experience difficulty in breaking through the *glass ceiling*. This invisible barrier to career advancement prevents women and ethnic minorities from holding managerial or executive jobs regardless of their accomplishments and merits (Hynes & Davis, 2009).

Review *Connect* Reflect

LG5 Explain the key dimensions of careers and work in early adulthood.

Review

- What are some developmental changes in careers and work?
- What does Damon argue is missing in many individuals' career pursuits?
- Which areas are likely to offer the greatest increase in jobs in the next decade?
- What are some important things to know about work?
- What characterizes diversity in the workplace?

Connect

- How might what you learned about gender in Chapter 10 relate to what you learned in this section about how gender affects work opportunities and work environments?

Reflect *Your Own Personal Journey of Life*

- If you are an emerging adult, what careers do you want to pursue? How much education will they take? If you are older, how satisfied are you with your career choices as an emerging adult and young adult? Explain.

topical **connections**

At some point in middle age, more time stretches behind us than ahead of us. Midlife is changing—entered later and lasting longer—for many people. Middle adulthood is a time of declining physical skills and expanding responsibility, as well as balancing work and relationships. For many individuals, cognitive abilities peak in middle age, although some aspects of information processing, such as perceptual speed and memory, decline. Work continues to be central to people's lives in middle adulthood. Middle age also is when individuals become more interested in the meaning of life.

looking ***forward***

reach your **learning goals**

Physical and Cognitive Development in Early Adulthood

1 The Transition From Adolescence to Adulthood

LG1 Describe the transition from adolescence to adulthood.

Becoming an Adult

- Emerging adulthood is the term now given to the transition from adolescence to adulthood. Its age range is about 18 to 25 years of age, and it is characterized by experimentation and exploration. There is both continuity and change in the transition from adolescence to adulthood. Two criteria for adult status are economic independence and taking responsibility for the consequences of one's actions.

The Transition From High School to College

- The transition from high school to college can involve both positive and negative features. Although students may feel more grown up and be intellectually challenged by academic work, for many the transition involves a focus on the stressful move from being the oldest and most powerful group of students to being the youngest and least powerful group. U.S. college students today report experiencing more stress and are more depressed than college students in the past.

2 Physical Development

LG2 Identify the changes in physical development in young adults.

Physical Performance and Development

- Peak physical performance is often reached between 19 and 26 years of age. Toward the latter part of early adulthood, a detectable slowdown in physical performance is apparent for most individuals.

Health

- Emerging adults have more than twice the mortality rate of adolescents, with males being mainly responsible for the increase. Despite their higher mortality rate, emerging adults in general have few chronic health problems. Many emerging adults develop bad health habits that can affect their health later in life.

Eating and Weight

- Obesity is a serious problem, with about 33 percent of Americans overweight enough to be at increased health risk. Heredity, leptin, set point, and environmental factors are involved in obesity. Most diets don't work long term. For those that do, exercise is usually an important component.

Regular Exercise

- Both moderate and intense exercise produce important physical and psychological gains.

Substance Abuse

- By the mid-twenties, a reduction in alcohol and drug use often takes place. Binge drinking among college students is still a major concern and can cause students to miss classes, have trouble with police, and have unprotected sex. Alcoholism is a disorder that impairs an individual's health and social relationships. Fewer young adults are smoking cigarettes. Most adult smokers would like to quit but their addiction to nicotine makes quitting a challenge.

3 Sexuality

LG3 Discuss sexuality in young adults.

Sexual Activity in Emerging Adulthood

- Emerging adulthood is a time during which most individuals are sexually active and become married. Emerging adults have sexual intercourse with more individuals than young adults, but they have sex less frequently. Also, casual sex is more common in emerging adulthood than young adulthood.

Sexual Orientation and Behavior

- In the 1994 Sex in America survey, American adults' sexual lives were portrayed as more conservative than previously believed. An individual's sexual preference likely is the result of a combination of genetic, hormonal, cognitive, and environmental factors.

Sexually Transmitted Infections

- Also called STIs, sexually transmitted infections are contracted primarily through sexual contact. The STI that has received the most attention in the last several decades is infection with HIV, which can lead to AIDS (acquired immune deficiency syndrome). A person with AIDS has a weakened immune system—even a cold can be life threatening.

Forcible Sexual Behavior and Sexual Harassment

- Rape is forcible sexual intercourse with a person who does not give consent. Date or acquaintance rape involves coercive sexual activity directed at someone with whom the victim is at least casually acquainted. Sexual harassment occurs when one person uses his or her power over another individual in a sexual manner, which can result in serious psychological consequences for the victim.

4 Cognitive Development

LG4 Characterize cognitive changes in early adulthood.

Cognitive Stages

- Formal operational thought, entered at about age 11 to 15, is Piaget's final cognitive stage. According to Piaget, although adults are quantitatively more knowledgeable than adolescents, adults do not enter a new, qualitatively different stage. Some experts argue that the idealism of Piaget's formal operational stage declines in young adults and is replaced by more realistic, pragmatic thinking. Some propose that differences like these constitute a qualitatively different, fifth cognitive stage, called postformal thought.

Creativity

- Creativity peaks in adulthood, often in the forties, and then declines. However, there is extensive individual variation in lifetime creative output. Csikszentmihalyi proposed that the first step toward living a creative life is to cultivate curiosity and interest.

5 Careers and Work

LG5 Explain the key dimensions of career and work in early adulthood.

Developmental Changes

- Many young children have idealistic fantasies about a career. In the late teens and early twenties, their career thinking has usually turned more serious. By their early to mid-twenties, many individuals have completed their education or training and started in a career. In the remainder of early adulthood, they seek to establish their emerging career and start moving up the career ladder. Many individuals believe in the career mystique but recently this has become a myth for increasing numbers of Americans.

Finding a Path to Purpose

- Damon argues that too many individuals have not found a path to purpose in their career development. He concludes that too often individuals focus on short-term goals and don't explore the big, long-term picture of what they want to do with their lives.

Monitoring the Occupational Outlook

- Jobs that require a college education are expected to be the fastest growing and highest paying in the United States. In the next decade, especially education and health services, and business and professional services are projected to account for the most new jobs.

The Impact of Work

- Work defines people in fundamental ways and is a key aspect of their identity. Most individuals spend about one-third of their adult life at work. Eighty percent of part-time U.S. college students work while going to college. Working during college can have positive or negative outcomes. Unemployment produces stress regardless of whether the job loss is temporary, cyclical, or permanent. The increasing number of women who work in careers outside the home has led to new work-related issues. Because of dual-earner households, there has been a considerable increase in the time men spend in household work and child care.

Diversity in the Workplace

- The U.S. workplace has become increasingly diverse. Women have increased their share of the workforce in recent years. Latinos are projected to have a larger percentage of the U.S. workforce than African Americans by 2016.

key **terms**

emerging adulthood 416
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chapter 14

SOCIOEMOTIONAL DEVELOPMENT IN EARLY ADULTHOOD

chapter **outline**

1 Stability and Change From Childhood to Adulthood

Learning Goal 1 Describe stability and change in temperament, and summarize adult attachment styles.

Temperament
Attachment

2 Attraction, Love, and Close Relationships

Learning Goal 2 Identify some key aspects of attraction, love, and close relationships.

Attraction
The Faces of Love
Falling Out of Love

3 Adult Lifestyles

Learning Goal 3 Characterize adult life styles.

Single Adults
Cohabiting Adults
Married Adults
Divorced Adults
Remarried Adults
Gay and Lesbian Adults

4 Marriage and the Family

Learning Goal 4 Discuss making marriages work, parenting, and divorce.

Making Marriage Work
Becoming a Parent
Dealing with Divorce

5 Gender, Relationships, and Self-Development

Learning Goal 5 Summarize the role of gender in relationships.

Gender and Communication
Women's Development
Men's Development

Commitment is an important issue in a romantic relationship for most individuals. Consider Gwenna, who decides that it is time to have a talk with Greg about his commitment to their relationship (Lerner, 1989, pp. 44–45):

> She shared her perspective on both the strengths and weaknesses of their relationship and what her hopes were for the future. She asked Greg to do the same. Unlike earlier conversations, this one was conducted without her pursuing him, pressuring him, or diagnosing his problems with women. At the same time, she asked Greg some clear questions, which exposed his vagueness.
>
> "How will you know when you are ready to make a commitment? What specifically would you need to change or be different than it is today?"
>
> "I don't know," was Greg's response. When questioned further, the best he could come up with was that he'd just feel it.
>
> "How much more time do you need to make a decision one way or another?"
>
> "I'm not sure," Greg replied. "Maybe a couple of years, but I really can't answer a question like that. I can't predict my feelings."
>
> And so it went.
>
> Gwenna really loved this man, but two years (and maybe longer) was longer than she could comfortably wait. So, after much thought she told Greg that she would wait till fall (about ten months), and that she would move on if he couldn't commit himself to marriage by then. She was open about her wish to marry and have a family with him, but she was equally clear that her first priority was a mutually committed relationship. If Greg was not at that point by fall, then she would end the relationship—painful though it would be.
>
> During the waiting period, Gwenna was able to not pursue him and not get distant or otherwise reactive to his expressions of ambivalence and doubt. In this way she gave Greg emotional space to struggle with his dilemma and the relationship had its best chance of succeeding. Her bottom-line position ("a decision by fall") was not a threat or an attempt to rope Greg in, but rather a clear statement of what was acceptable to her.
>
> When fall arrived, Greg told Gwenna he needed another six months to make up his mind. Gwenna deliberated a while and decided she could live with that. But when the six months were up, Greg was uncertain and asked for more time. It was then that Gwenna took the painful but ultimately empowering step of ending their relationship.

topical **connections**

A key aspect of socioemotional development in adolescence is an increased interest in identity; many of the key changes in identity, though, take place in emerging adulthood. Seeking autonomy in healthy ways while still being securely attached to parents are important aspects of parent-adolescent relationships. Adolescents also are motivated to spend more time with peers and friendships become more intimate. And romantic relationships begin to take a more central role in adolescents' lives.

looking ***back***

preview

Love is of central importance in each of our lives, as it is in Gwenna and Greg's lives. Shortly, we will discuss the many faces of love, as well as marriage and the family, the diversity of adult lifestyles, and the role of gender in relationships. To begin, though, we will return to an issue we initially considered in Chapter 1: stability and change.

1 Stability and Change From Childhood to Adulthood

LG1 Describe stability and change in temperament, and summarize adult attachment styles.

- Temperament
- Attachment

For adults, socioemotional development revolves around adaptively integrating our emotional experiences into enjoyable relationships with others on a daily basis (Duck, 2011). Young adults like Gwenna and Greg face choices and challenges in adopting lifestyles that will be emotionally satisfying, predictable, and manageable for them. They do not come to these tasks as blank slates, but do their decisions and actions simply reflect the persons they had become by the ages of 10 to 20?

Current research shows that the first 20 years of life are not meaningless in predicting an adult's socioemotional life (McAdams & Olsen, 2010; Sroufe, Coffino, & Carlson, 2010). And there is also every reason to believe that experiences in the early adult years are important in determining what the individual is like later in adulthood. A common finding is that the smaller the time intervals over which we measure socioemotional characteristics, the more similar an individual will look from one measurement to the next. Thus, if we measure an individual's self-concept at the age of 20 and then again at the age of 30, we will probably find more stability than if we measured the individual's self-concept at the age of 10 and then again at the age of 30.

In trying to understand the young adult's socioemotional development, it would be misleading to look at an adult's life only in the present tense, ignoring the unfolding of social relationships and emotions. So, too, it would be a mistake to search only through a 30-year-old's first 5 to 10 years of life in trying to understand why he or she is having difficulty in a close relationship.

TEMPERAMENT

How stable is temperament? Recall that *temperament* is an individual's behavioral style and characteristic emotional responses. In early adulthood, most individuals show fewer emotional mood swings than they did in adolescence, and they become more responsible and engage in less risk-taking behavior (Caspi, 1998). Along with these signs of a general change in temperament, researchers also find links between some dimensions of childhood temperament and adult personality. For example, in one longitudinal study, children who were highly active at age 4 were likely to be very outgoing at age 23 (Franz, 1996).

Are other aspects of temperament in childhood linked with adjustment in adulthood? In Chapter 6, we saw that researchers have proposed various ways of describing and classifying types and dimensions of personality. Research has linked several of these types and dimensions during childhood with characteristics of adult personality. For example:

- *Easy and difficult temperaments.* In one longitudinal study, children who had an easy temperament at 3 to 5 years of age were likely to be well adjusted as

developmental **connection**

Personality. Among the main temperament categories are Chess and Thomas' easy and difficult; Kagan's inhibition; and Rothbart and Bates' effortful control (self-regulation). Chapter 6, p. 183

young adults (Chess & Thomas, 1987). In contrast, many children who had a difficult temperament at 3 to 5 years of age were not well adjusted as young adults. Also, other researchers have found that boys with a difficult temperament in childhood are less likely as adults to continue their formal education, and girls with a difficult temperament in childhood are more likely to experience marital conflict as adults (Wachs, 2000).

- *Inhibition.* Individuals who had an inhibited temperament in childhood are less likely than other adults to be assertive or experience social support, and more likely to delay entering a stable job track (Wachs, 2000). A longitudinal study revealed that the 15 percent most inhibited boys and girls at 4 to 6 years of age were rated as inhibited by their parents and delayed having a stable partnership and finding a first full-time job at 23 years of age (Asendorph, Denissen, & van Aken, 2008). And in the Uppsala (Sweden) Longitudinal Study, shyness/inhibition in infancy/childhood was linked to social anxiety at 21 years of age (Bohlin & Hagekull, 2009).
- *Ability to control one's emotions.* In one longitudinal study, when 3-year-old children showed good control of their emotions and were resilient in the face of stress, they were likely to continue to handle emotions effectively as adults (Block, 1993). By contrast, when 3-year-olds had low emotional control and were not very resilient, they were likely to show problems in these areas as young adults.

To what extent is temperament in childhood linked to temperament in adulthood?

In sum, these studies reveal some continuity between certain aspects of temperament in childhood and adjustment in early adulthood. However, keep in mind that these connections between childhood temperament and adult adjustment are based on only a small number of studies, and more research is needed to verify these linkages. Indeed, Theodore Wachs (1994, 2000) proposed ways that linkages between temperament in childhood and personality in adulthood might vary depending on the intervening contexts in individuals' experience. For example, Figure 14.1 describes contexts in which an infant who displayed an inhibited temperament might develop a relatively sociable adult personality. As discussed in

Initial Temperament Trait: Inhibition

	Child A	**Child B**
	Intervening Context	
Caregivers	Caregivers (parents) who are sensitive and accepting, and let child set his or her own pace.	Caregivers who use inappropriate "low-level control" and attempt to force the child into new situations.
Physical Environment	Presence of "stimulus shelters" or "defensible spaces" that the children can retreat to when there is too much stimulation.	Child continually encounters noisy, chaotic environments that allow no escape from stimulation.
Peers	Peer groups with other inhibited children with common interests, so the child feels accepted.	Peer groups consist of athletic extroverts, so the child feels rejected.
Schools	School is "undermanned," so inhibited children are more likely to be tolerated and feel they can make a contribution.	School is "overmanned," so inhibited children are less likely to be tolerated and more likely to feel undervalued.
	Personality Outcomes	
	As an adult, individual is closer to extraversion (outgoing, sociable) and is emotionally stable.	As an adult, individual is closer to introversion and has more emotional problems.

FIGURE **14.1**

TEMPERAMENT IN CHILDHOOD, PERSONALITY IN ADULTHOOD, AND INTERVENING CONTEXTS. Varying experiences with caregivers, the physical environment, peers, and schools can modify links between temperament in childhood and personality in adulthood. The example given here is for inhibition.

Chapter 6, many aspects of the environment—including gender, culture, parenting, and goodness of fit generally—may influence the persistence of aspects of a child's temperament through life.

ATTACHMENT

developmental **connection**

Attachment. Secure and insecure attachment have been proposed as important aspects of infants' and adolescents' socioemotional development. Chapter 6, p. 191; Chapter 12, p. 390

Like temperament, attachment appears during infancy and plays an important part in socioemotional development (Sroufe, Coffino, & Carlson, 2010). We discussed its role in infancy and adolescence (see Chapters 6 and 12). How do these earlier patterns of attachment and adults' attachment styles influence the lives of adults?

Although relationships with romantic partners differ from those with parents, romantic partners fulfill some of the same needs for adults as parents do for their children (Campa, Hazan, & Wolfe, 2009; Shaver & Mikulincer, 2011). Recall from Chapter 6 that *securely attached* infants are defined as those who use the caregiver as a secure base from which to explore the environment. Similarly, adults may count on their romantic partners to be a secure base to which they can return and obtain comfort and security in stressful times (Feeney, 2008).

Do adult attachment patterns with partners reflect childhood attachment patterns with parents? In a retrospective study, Cindy Hazan and Philip Shaver (1987) revealed that young adults who were securely attached in their romantic relationships were more likely to describe their early relationship with their parents as securely attached. In a longitudinal study, infants who were securely attached at 1 year of age were securely attached 20 years later in their adult romantic relationships (Steele & others, 1998). However, in another longitudinal study links between early attachment styles and later attachment styles were lessened by stressful and disruptive experiences, such as the death of a parent or instability of caregiving (Lewis, Feiring, & Rosenthal, 2000).

Hazan and Shaver (1987, p. 515) measured attachment styles using the following brief assessment:

Read each paragraph and then place a check mark next to the description that best describes you:

____1. I find it relatively easy to get close to others and I am comfortable depending on them and having them depend on me. I don't worry about being abandoned or about someone getting too close to me.

____2. I am somewhat uncomfortable being close to others. I find it difficult to trust them completely and to allow myself to depend on them. I get nervous when anyone gets too close to me and it bothers me when someone tries to be more intimate with me than I feel comfortable with.

____3. I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner, and this sometimes scares people away.

These items correspond to three attachment styles—secure attachment (option 1 above) and two insecure attachment styles (avoidant—option 2 above, and anxious—option 3 above):

- **Secure attachment style.** Securely attached adults have positive views of relationships, find it easy to get close to others, and are not overly concerned with or stressed out about their romantic relationships. These adults tend to enjoy sexuality in the context of a committed relationship and are less likely than others to have one-night stands.
- **Avoidant attachment style.** Avoidant individuals are hesitant about getting involved in romantic relationships and once in a relationship tend to distance themselves from their partner.
- **Anxious attachment style.** These individuals demand closeness, are less trusting, and are more emotional, jealous, and possessive.

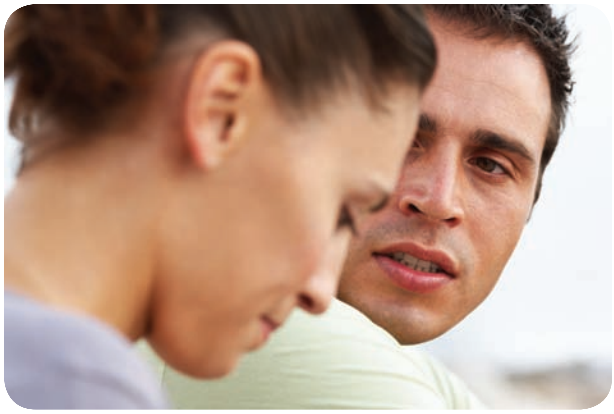
secure attachment style An attachment style that describes adults who have positive views of relationships, find it easy to get close to others, and are not overly concerned or stressed out about their romantic relationships.

avoidant attachment style An attachment style that describes adults who are hesitant about getting involved in romantic relationships and once in a relationship tend to distance themselves from their partner.

anxious attachment style An attachment style that describes adults who demand closeness, are less trusting, and are more emotional, jealous, and possessive.

The majority of adults (about 60 to 80 percent) describe themselves as securely attached, and not surprisingly adults prefer having a securely attached partner (Zeifman & Hazan, 2008).

Researchers are studying links between adults' current attachment styles and many aspects of their lives (Cowan & Cowan, 2009; Shaver & Mikulincer, 2011). For example, securely attached adults are more satisfied with their close relationships than insecurely attached adults, and the relationships of securely attached adults are more likely to be characterized by trust, commitment, and longevity (Feeney, 2008). Securely attached adults also are more likely than insecurely attached adults to provide support when they are distressed and more likely to give support when their partner is distressed (Rholes & Simpson, 2007). Also, a recent study of 18- to 20-year-olds revealed that recent secure attachment to parents was linked to ease in forming friendships in college (Parade, Leerkes, & Blankson, 2010). And another research review of 10,000 adult attachment interviews revealed that attachment insecurity was linked to depression (Bakermans-Kranenburg, & van IJzendoorn, 2009).



What are some key dimensions of attachment in adulthood, and how are they related to relationship patterns and well-being?

Recent interest in adult attachment also focuses on ways that genes can affect how adults experience the environment (Diamond, 2009). A recent study examined the link between the serotonin transporter gene (5-HTTLPR) and adult unresolved attachment (Caspers & others, 2009). Unresolved attachment was assessed in an attachment interview and involved such speech patterns as indicating that the deceased parent was still playing a major role in the adult's life and giving excessive detail about the death. In this study, parental loss in early childhood was more likely to result in unresolved attachment in adulthood only for individuals who had the short version of the gene; the long version of the gene apparently provided some protection from the negative psychological effects of parental loss. Recall from Chapter 2 that this type of research is called gene × environment (G × E) interaction.

A research review and conceptualization of attachment by leading experts Mario Mikulincer and Phillip Shaver (2007) concluded the following about the benefits of secure attachment. Individuals who are securely attached have a well-integrated sense of self-acceptance, self-esteem, and self-efficacy. They have the ability to control their emotions, are optimistic, and are resilient. Facing stress and adversity, they activate cognitive representations of security, are mindful of what is happening around them, and mobilize effective coping strategies.

Mikulincer and Shaver's (2007) review also concluded that attachment insecurity places couples at risk for relationship problems. For example, when an anxious individual is paired with an avoidant individual, the anxious partner's needs and demands frustrate the avoidant partner's preference for distance in the relationship; the avoidant partner's need for distance causes stress for the anxious partner's need for closeness. The result: Both partners are unhappy in the relationship and the anxious-avoidant pairing can produce abuse or violence when a partner criticizes or tries to change the other's behavior. Researchers also have found that when both partners have an anxious attachment pattern, the pairing usually produces dissatisfaction with the marriage and can lead to a mutual attack and retreat in the relationship (Feeney, 2008). When both partners have an anxious attachment style, they feel misunderstood and rejected, excessively dwell on their own insecurities, and seek to control the other's behavior (Shaver & Mikulincer, 2011).

If you have an insecure attachment style, are you stuck with it and does it doom you to have problematic relationships? Attachment categories are somewhat stable in adulthood but adults do have the capacity to change their attachment thinking and behavior. Although attachment insecurities are linked to relationship problems, attachment style makes only a moderate-size contribution to relationship functioning in that other factors contribute to relationship satisfaction and success (Shaver & Mikulincer, 2011). Later in the chapter, we will discuss such factors in our coverage of marital relationships.

Review *Connect* Reflect

LG1 Describe stability and change in temperament, and summarize adult attachment styles.

Review

- How stable is temperament from childhood to adulthood?
- What attachment styles characterize adults, and how are they linked to relationship outcomes?

Connect

- In Chapter 12, what behaviors were linked to insecure attachment in adolescence?

Reflect *Your Own Personal Journey of Life*

- What is your attachment style? How do you think it affects your relationships?

2 Attraction, Love, and Close Relationships

LG2 Identify some key aspects of attraction, love, and close relationships.

Attraction

The Faces of Love

Falling Out of Love

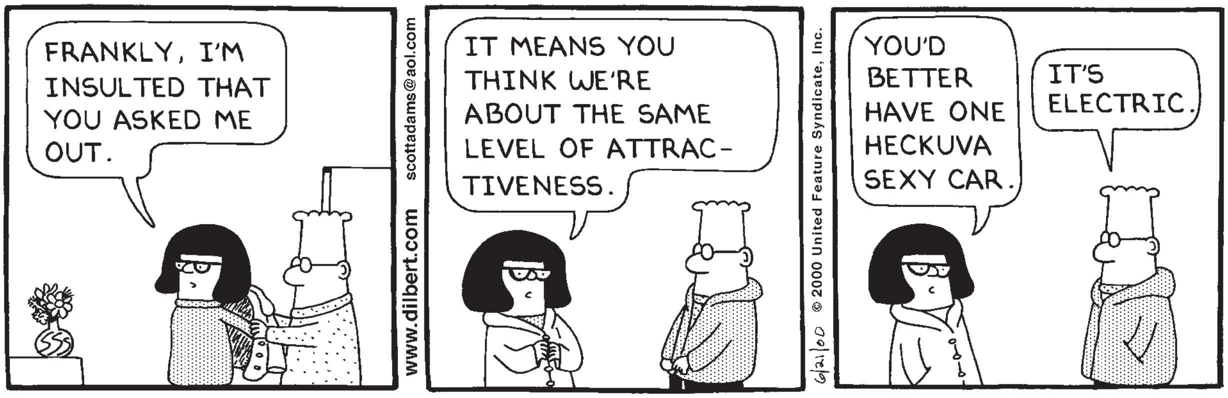
These are the themes of our exploration of close relationships: how they get started in the first place, the faces of love, and falling out of love.

ATTRACTION

What attracts people like Gwenna and Greg to each other and motivates them to spend more time with each other? How important are personality traits and physical attraction in determining the relationships we form?

Familiarity and Similarity Familiarity may breed contempt, as the old saying goes, but social psychologists have found that familiarity is a necessary condition for a close relationship to develop. For the most part, friends and lovers are people who have been around each other for a long time; they may have grown up together, gone to high school or college together, worked together, or gone to the same social events.

Another old saying, "Birds of a feather flock together," also helps to explain attraction. Overall, our friends and lovers are much more like us than unlike us (Guerrero, Andersen, & Afifi, 2011; Qian, 2009). Friends and lovers tend to have similar attitudes,


FRANKLY, I'M INSULTED THAT YOU ASKED ME OUT.
scottadams@aol.com
www.dilbert.com
IT MEANS YOU THINK WE'RE ABOUT THE SAME LEVEL OF ATTRACTIVENESS.
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6/21/00
YOU'D BETTER HAVE ONE HECKUVA SEXY CAR.
IT'S ELECTRIC.

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values, lifestyles, and physical attractiveness. For some characteristics, though, opposites may attract. An introvert may wish to be with an extravert, or someone with little money may wish to associate with someone who is wealthy, for example.

Why are people attracted to others who have similar attitudes, values, and lifestyles? **Consensual validation** is one reason. Our own attitudes and values are supported when someone else's attitudes and values are similar to ours—their attitudes and values validate ours. Another reason that similarity matters is that people tend to shy away from the unknown. We often prefer to be around people whose attitudes and values we can predict. And similarity implies that we will enjoy doing things with another person who likes the same things and has similar attitudes.

FRAN
This is DEFINATELY the last time I arrange a date over the internet...

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Recently, attraction has not only taken place in person but also over the Internet (Frazzetto, 2010; Pujazon-Zazik & Park, 2010). More than 16 million individuals in the United States and 14 million in China have tried online matchmaking (Masters, 2008). Some critics argue that online romantic relationships lose the interpersonal connection while others emphasize that the Internet may benefit shy or anxious individuals who find it difficult to meet potential partners in person (Holmes, Little, & Welsh, 2009). One problem with online matchmaking is that many individuals misconstrue their characteristics, such as how old they are, how attractive they are, and their occupation. Despite such dishonesty, researchers have found that romantic relationships initiated on the Internet are more likely than relationships established in person to last for more than two years (Bargh & McKenna, 2004).

Physical Attractiveness As important as familiarity and similarity may be, they do not explain the spark that often ignites a romantic relationship: physical attractiveness. How important is physical attractiveness in relationships? Psychologists do not consider the link between physical beauty and attraction to be as clear-cut as many advertising agencies would like us to believe. For example, psychologists have determined that men and women differ on the importance of good looks when they seek an intimate partner. Women tend to rate as most important such traits as considerateness, honesty, dependability, kindness, understanding, and earning prospects; men prefer good looks, cooking skills, and frugality (Buss & Barnes, 1986; Eastwick & Finkel, 2008).

Complicating research about the role of physical attraction is changing standards of what is deemed attractive (Haas, 2009). The criteria for beauty can differ, not just across cultures, but over time within cultures as well. In the 1950s, the ideal of female beauty in the United States was typified by the well-rounded figure of Marilyn Monroe. Today, Monroe's 135-pound, 5-foot, 5-inch physique might be regarded as a bit overweight. The current ideal physique for both men and women is neither pleasingly plump nor extremely slender.

The force of similarity also operates at a physical level. We usually seek out someone at our own level of attractiveness in physical characteristics as well as social attributes we addressed previously. Research validates the **matching hypothesis,** which states that, although we may prefer a more attractive person in the abstract, in the real world we end up choosing someone who is close to our own level of attractiveness. However, a recent study revealed that the matching hypothesis did not hold for couples once they became married (McNulty, Karney, & Neff, 2008). In the first six months of the marriage, the only link between levels of attractiveness and various aspects of the marital relationship was that attractive husbands were less satisfied. Also, rather than similarity, it was the difference between marital partners' attractiveness that best predicted their behavior toward each other: Both spouses behaved more positively when the wife was more attractive and behaved more negatively when the husband was more attractive. Thus, although

consensual validation An explanation of why individuals are attracted to people who are similar to them. Our own attitudes and behavior are supported and validated when someone else's attitudes and behavior are similar to our own.

matching hypothesis States that although we prefer a more attractive person in the abstract, in the real world we end up choosing someone who is close to our own level.

matched attractiveness plays a powerful role early in relationships, it may have less influence in marriage.

THE FACES OF LOVE

Once we are initially attracted to another person, other opportunities exist that may deepen the relationship to love. Love refers to a vast and complex territory of human behavior, spanning a range of relationships that includes friendship, romantic love, affectionate love, and consummate love (Berscheid, 2010). In most of these types of love, one recurring theme is intimacy (Weis & Sternberg, 2008).

developmental **connection**

Cognitive Theory. Erikson's adolescence stage is identity versus identity confusion and his middle adulthood stage is generativity versus stagnation. Chapter 12, p. 384; Chapter 16, p. 503

Intimacy

Self-disclosure and the sharing of private thoughts are hallmarks of intimacy. As we discussed in Chapter 12, adolescents have an increased need for intimacy. At the same time, they are engaged in the essential tasks of developing an identity and establishing their independence from their parents. Juggling the competing demands of intimacy, identity, and independence also becomes a central task of adulthood.

We are what we love.

—Erik Erikson

Danish-Born American Psychoanalyst and Author, 20th Century

Erikson's Stage: Intimacy Versus Isolation Recall from our discussion in Chapter 12 that Erik Erikson (1968) argues that identity versus identity confusion—pursuing who we are, what we are all about, and where we are going in life—is the most important issue to be negotiated in adolescence. In early adulthood, according to Erikson, after individuals are well on their way to establishing stable and successful identities, they enter the sixth developmental stage, which is intimacy versus isolation. Erikson describes intimacy as finding oneself while losing oneself in another person, and it requires a commitment to another person. If a person fails to develop an intimate relationship in early adulthood, according to Erikson, isolation results.

An inability to develop meaningful relationships with others can harm an individual's personality. It may lead individuals to repudiate, ignore, or attack those who frustrate them. Such circumstances account for the shallow, almost pathetic attempts of youth to merge themselves with a leader. Many youth want to be apprentices or disciples of leaders and adults who will shelter them from the harm of the "out-group" world. If this fails—and Erikson points out that it must—sooner or later the individuals recoil into a self-search to discover where they went wrong. This introspection sometimes leads to painful depression and isolation. It also may contribute to a mistrust of others.

Why is intimacy an important aspect of early adulthood?

Intimacy and Independence Development in early adulthood often involves balancing intimacy and commitment on the one hand, and independence and freedom on the other. At the same time as individuals are trying to establish an identity, they face the challenges of increasing their independence from their parents, developing an intimate relationship with another individual, and continuing their friendship commitments. They also face the task of making decisions for themselves without always relying on what others say or do.

The extent to which young adults develop autonomy has important implications for them. For example, young adults who have not sufficiently moved away from parental ties may have difficulty in both interpersonal relationships and a career.

The balance between intimacy and commitment on the one hand, and independence and freedom on the other, is delicate. Some individuals are able to experience a healthy independence and freedom along with an intimate relationship. Keep in mind that intimacy and commitment, and independence and freedom, are not just concerns of early adulthood. They are important themes of development that are worked and reworked throughout the adult years.

developmental **connection**

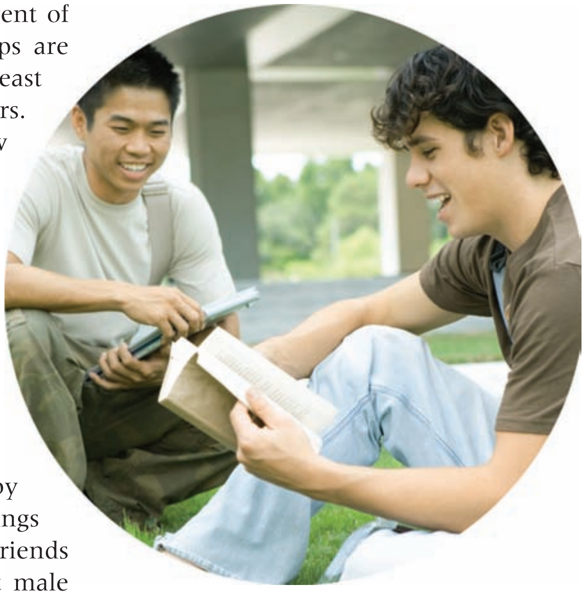
Personality. Independence is an important aspect of the second year of life and adolescence. Chapter 8, p. 254; Chapter 12, p. 389

Friendship

Increasingly researchers are finding that friendship plays an important role in development throughout the human life span (Rawlins, 2009). Most

U.S. men and women have a best friend—92 percent of women and 88 percent of men have a best friend of the same sex (Blieszner, 2009). Many friendships are longlasting as 65 percent of U.S. adults have known their best friend for at least 10 years and only 15 percent have known their best friend for less than 5 years. Adulthood brings opportunities for new friendships as individuals move to new locations and may establish new friendships in their neighborhood or at work (Blieszner, 2009).

Gender Differences in Friendships As in the childhood and adolescent years, there are gender differences in adult friendship. Compared with men, women have more close friends and their friendships involve more self-disclosure and exchange of mutual support (Dow & Wood, 2006). Women are more likely to listen at length to what a friend has to say and be sympathetic, and women have been labeled as "talking companions" because talk is so central to their relationship (Gouldner & Strong, 1987). Women's friendships tend to be characterized not only by depth but also by breadth: Women share many aspects of their experiences, thoughts, and feelings (Wood, 2001). When female friends get together, they like to talk, but male friends are more likely to engage in activities, especially outdoors. Thus, the adult male pattern of friendship often involves keeping one's distance while sharing useful information. Men are less likely than women to talk about their weaknesses with their friends, and men want practical solutions to their problems rather than sympathy (Tannen, 1990). Also, adult male friendships are more competitive than those of women (Wood, 2001).



How is adult friendship different among female friends, male friends, and cross-gender friends?

Friendships Between Women and Men What about female-male friendship? Cross-gender friendships are more common among adults than among elementary school children, but not as common as same-gender friendships in adulthood (Blieszner, 2009). Cross-gender friendships can provide both opportunities and problems (Rawlins, 2009). The opportunities involve learning more about common feelings and interests and shared characteristics, as well as acquiring knowledge and understanding of beliefs and activities that historically have been typical of one gender.

Problems can arise in cross-gender friendships because of different expectations. One problem that can plague an adult cross-gender friendship is unclear sexual boundaries, which can produce tension and confusion.

Romantic Love Some friendships evolve into **romantic love,** which is also called passionate love, or eros. Romantic love has strong components of sexuality and infatuation, and it often predominates in the early part of a love relationship (Berscheid, 2010; Regan, 2008).

A complex intermingling of different emotions goes into romantic love—including such emotions as passion fear, anger, sexual desire, joy, and jealousy (Regan, 2008). Well-known love researcher Ellen Berscheid (1988) says that sexual desire is the most important ingredient of romantic love. Obviously, some of these emotions are a source of anguish, which can lead to other issues such as depression.

> Love is a canvas furnished by nature and embroidered by imagination.
>
> —VOLTAIRE
> *French Essayist, 18th Century*

Affectionate Love Love is more than just passion (Berscheid, 2010). **Affectionate love,** also called *companionate love,* is the type of love that occurs when someone desires to have the other person near and has a deep, caring affection for the person. The early stages of love have more romantic love ingredients—but as love matures, passion tends to give way to affection.

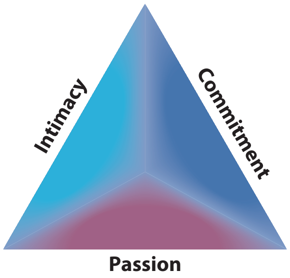
Consummate Love So far we have discussed two forms of love: romantic (or passionate) and affectionate (or companionate). According to Robert J. Sternberg (1988), these are not the only forms of love. Sternberg proposed a triarchic theory

romantic love Also called passionate love, or eros, romantic love has strong sexual and infatuation components and often predominates in the early period of a love relationship.

affectionate love In this type of love, also called companionate love, an individual desires to have the other person near and has a deep, caring affection for the other person.

FIGURE **14.2**

STERNBERG'S TRIANGLE OF LOVE. Sternberg identified three types of love: passion, intimacy, and commitment. Various combinations of these result in infatuation, affectionate love, fatuous love, and consummate love.



Types of Love	**Passion**	**Intimacy**	**Commitment**
Infatuation	■	□	□
Affectionate love	□	■	■
Fatuous love	■	□	■
Consummate love	■	■	■

■ Present □ Absent or low

of love in which love can be thought of as a triangle with three main dimensions—passion, intimacy, and commitment. Passion, as described earlier in the romantic love section, is physical and sexual attraction to another. Intimacy relates to the emotional feelings of warmth, closeness, and sharing in a relationship. Commitment is the cognitive appraisal of the relationship and the intent to maintain the relationship even in the face of problems.

What are some negative aspects of being in love when love is not returned?

In Sternberg's theory, the strongest, fullest form of love is *consummate love,* which involves all three dimensions (see Figure 14.2). If passion is the only ingredient in a relationship (with intimacy and commitment low or absent), we are merely *infatuated.* An affair or a fling in which there is little intimacy and even less commitment is an example. A relationship marked by intimacy and commitment but low or lacking in passion is called *affectionate love,* a pattern often found among couples who have been married for many years. If passion and commitment are present but intimacy is not, Sternberg calls the relationship *fatuous love,* as when one person worships another from a distance. But if couples share all three dimensions—passion, intimacy, and commitment—they experience consummate love (Sternberg & Sternberg, 2010).

FALLING OUT OF LOVE

The collapse of a close relationship may feel tragic. In the long run, however, as was the case for Gwenna, our happiness and personal development may benefit from getting over being in love and ending a close relationship.

In particular, ending a close relationship may be wise if you are obsessed with a person who repeatedly betrays your trust; if you are involved with someone who is draining you emotionally or financially or both; or if you are desperately in love with someone who does not return your feelings.

Being in love when love is not returned can lead to depression, obsessive thoughts, sexual dysfunction, inability to work effectively, difficulty in making new friends, and self-condemnation. When

connecting through research

What Are the Positive Outcomes to a Romantic Relationship Breakup?

Studies of romantic breakups have mainly focused on their negative aspects (Kato, 2005). Few studies have examined the possibility that a romantic breakup might lead to positive changes.

One study assessed the personal growth that can follow the breakup of a romantic relationship (Tashiro & Frazier, 2003). The participants were 92 undergraduate students who had experienced a relationship breakup in the past nine months. They were asked to describe "what positive changes, if any, have happened as a result of your breakup that might serve to improve your future romantic relationships" (p. 118).

Self-reported positive growth was common following a romantic breakup. Changes were categorized in terms of personal, relational, and environmental changes. The most commonly reported types of growth were personal changes, which included feeling stronger and more self-confident, more independent, and better off emotionally. Relational positive changes included gaining relational wisdom, and environmental positive changes included having better friendships because of the breakup. Figure 14.3 provides examples of these positive changes. Women reported more positive growth than did men.

Change category	Exemplars of frequently mentioned responses
Person positives	1. "I am more self-confident." 2. "Through breaking up I found I could handle more on my own." 3. "I didn't always have to be the strong one, it's okay to cry or be upset without having to take care of him."
Relational positives	1. "Better communication." 2. "I learned many relationship skills that I can apply in the future (for example, the importance of saying you're sorry)." 3. "I know not to jump into a relationship too quickly."
Environmental positives	1. "I rely on my friends more. I forgot how important friends are when I was with him." 2. "Concentrate on school more: I can put so much more time and effort toward school." 3. "I believe friends' and family's opinions count—will seek them out in future relationships."

FIGURE **14.3**

EXAMPLES OF POSITIVE CHANGES IN THE AFTERMATH OF A ROMANTIC BREAKUP

involved in unrequited love, thinking clearly in such relationships is often difficult, because our thoughts are so colored by arousing emotions (Guerrero, Andersen, & Afifi, 2011).

Are there any positive outcomes to a romantic relationship breakup? To find out, see *Connecting Through Research*.

Review *Connect* Reflect

LG2 Identify some key aspects of attraction, love, and close relationships.

Review

- What attracts someone to another person?
- What are some different types of love?
- What characterizes falling out of love?

Connect

- Describe how dating in adolescence differs from dating in early adulthood.

Reflect *Your Own Personal Journey of Life*

- Think about your own experiences with love. Based on those experiences, what advice about love would you give to someone else?

3 Adult Lifestyles

LG3 Characterize adult lifestyles.

- Single Adults
- Cohabiting Adults
- Married Adults
- Divorced Adults
- Remarried Adults
- Gay and Lesbian Adults

Adults today choose many lifestyles and form many types of families (Waite, 2009). They may choose to live alone, cohabit, marry, divorce, remarry, or live with someone of the same sex.

SINGLE ADULTS

Over a 30-year period, a dramatic rise in the percentage of single adults has occurred. From 2000 to 2006, there was a significant increase in the United States in single adults from 20 to 29 years of age (U.S. Census Bureau, 2007). In 2000, 64 percent of men in this age range said they were single, but by 2006 the percentage had increased to 73 percent, while the comparable percentages for women were 53 percent in 2000 and 62 percent in 2006.

Advantages of being single include having time to make decisions about one's life course, time to develop personal resources to meet goals, freedom to make autonomous decisions and pursue one's own schedule and interests, opportunities to explore new places and try out new things, and privacy. Common problems of single adults may include forming intimate relationships with other adults, confronting loneliness, and finding a niche in a society that is marriage-oriented (Koropeckjy-Cox, 2009). Stress may also be an issue. One national survey revealed that a higher percentage of singles (58 percent) reported they experienced extreme stress in the past month than married (52 percent) and divorced individuals (48 percent) (American Psychological Association, 2007).

Once adults reach the age of 30, there can be increasing pressure to settle down and get married. This is when many single adults make a conscious decision to marry or to remain single.

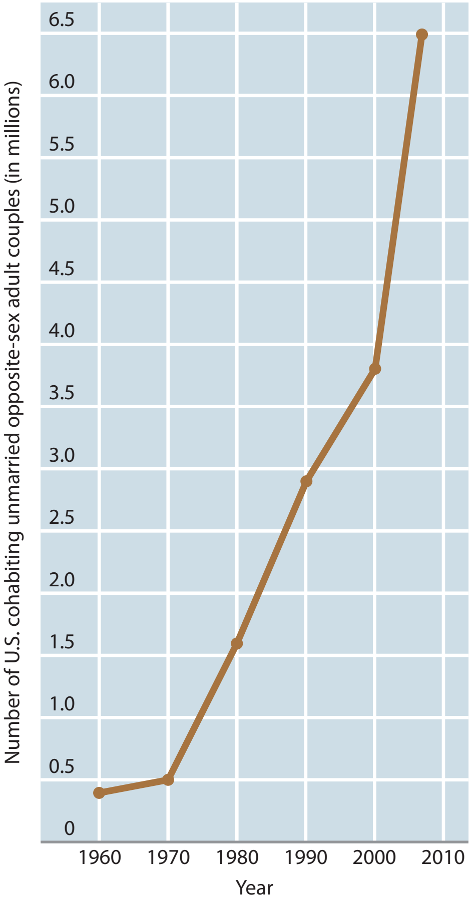


FIGURE **14.4**

THE INCREASE IN COHABITATION IN THE UNITED STATES. Since 1970, there has been a dramatic increase in the number of unmarried adults living together in the United States.

COHABITING ADULTS

Cohabitation refers to living together in a sexual relationship without being married. Cohabitation has undergone considerable changes in recent years. As indicated in Figure 14.4, there has been a dramatic increase in the number of cohabiting U.S. couples since 1970 with more than 75 percent cohabiting prior to getting married (Popenoe, 2009). And the trend shows no sign of letting up—from 3.8 million cohabiting couples in 2000 to 6.5 million cohabiting couples in 2007. Cohabiting rates are even higher in some countries—in Sweden, cohabitation before marriage is virtually universal (Stokes & Raley, 2009).

A number of couples view their cohabitation not as a precursor to marriage but as an ongoing lifestyle (Wilson & Stuchbury, 2010). These couples do not want the official aspects of marriage. In the United States, cohabiting arrangements tend to be short-lived, with one-third lasting less than a year (Hyde & DeLamater, 2008). Fewer than 1 out of 10 lasts five years. Of course, it is easier to dissolve a cohabitation relationship than to divorce.

Couples who cohabit face certain problems (Popenoe, 2008; Rhoades, Stanley, & Markman, 2009). Disapproval by parents and other family members can place emotional strain on the cohabiting couple. Some cohabiting couples have difficulty owning property jointly. Legal rights on the dissolution of the relationship are less certain than in a divorce. A recent study also revealed that cohabiting women experience an elevated risk of partner violence compared to married women (Brownridge, 2008).

If a couple lives together before they marry, does cohabiting help or harm their chances of later having a stable and happy marriage? The majority of studies have found lower rates of marital satisfaction and higher rates of divorce in couples who lived together before getting married (Whitehead & Popenoe, 2003). A recent study also revealed that the timing of cohabitation is an important factor in marital satisfaction (Rhoades, Stanley, & Markman, 2009). In this study, couples who cohabited before getting engaged reported lower marital satisfaction, dedication, and confidence, as well as increased likelihood of divorce, than couples who cohabited only after becoming engaged. A recent meta-analysis also found that individuals who had cohabited with a romantic partner were more likely to experience lower levels of marital quality and stability than their counterparts who had not cohabited (Jose, O'Leary, & Moyer, 2010). However, the negative link between cohabitation and marital instability did not hold up when only cohabitation with the eventual marital partner was studied, indicating that these cohabitors may attach more long-term meaning to living together.

What might explain the finding that cohabiting is linked with divorce more than not cohabiting? The most frequently given explanation is that the less traditional lifestyle of cohabitation may attract less conventional individuals who are not great believers in marriage in the first place (Whitehead & Popenoe, 2003). An alternative explanation is that the experience of cohabiting changes people's attitudes and habits in ways that increase their likelihood of divorce.

MARRIED ADULTS

Until about 1930, stable marriage was widely accepted as the endpoint of adult development. In the last 60 years, however, personal fulfillment both inside and outside marriage has emerged as a goal that competes with marital stability (Skolnick, 2007). The changing norm of male-female equality in marriage has produced marital relationships that are more fragile and intense than they were earlier in the twentieth century (Hoelter, 2009).

Marital Trends In recent years, marriage rates in the United States have declined (Waite, 2009). More adults are remaining single longer today, and the average duration of a marriage in the United States is currently just over nine years. In 2007, the U.S. average age for a first marriage climbed to 27.5 years for men and 25.6 years for women, higher than at any other point in history (U.S. Census Bureau, 2008). In 1980, the average age for a first marriage in the United States was 24 years for men and 21 years for women. In addition, the increase in cohabitation and a slight decline in the percentage of divorced individuals who remarry contribute to the decline in marriage rates in the United States (Stokes & Raley, 2009).

Despite the decline in marriage rates, the United States is still a marrying society (Popenoe, 2009). More than 90 percent of U.S. women still marry at some point in their lives, although projections indicate that in the future this rate will drop into the 80 to 90 percent range (Popenoe, 2008). If women and men are going to marry, virtually all do so by the time they are 45 years of age (Popenoe, 2008).

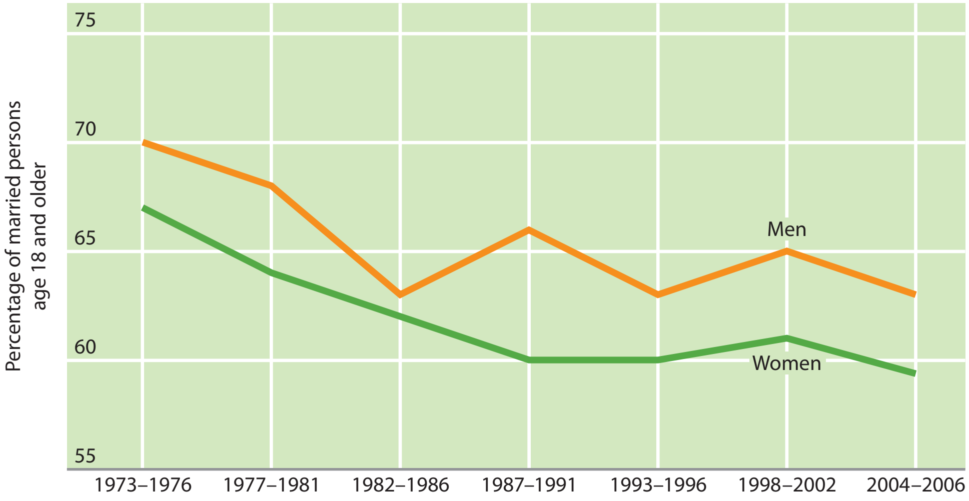
Is there a best age to get married? Marriages in adolescence are more likely to end in divorce than marriages in adulthood (Waite, 2009). However, researchers have not been able to pin down a specific age or age span for getting married in adulthood that is most likely to result in a successful marriage (Furstenberg, 2007).

How happy are people who do marry? The average duration of a marriage in the United States is currently just over nine years. As indicated in Figure 14.5, the percentage of married individuals in the United States who said their marriages were "very happy" declined from the 1970s through the early 1990s, but recently has begun to increase (Popenoe, 2009). Notice in Figure 14.5 that men consistently report being happier in their marriage than women.

> When two people are under the influence of the most violent, most insane, most delusive, and most transient of passions, they are required to swear that they will remain in that excited, abnormal, and exhausting condition continuously until death do them part.
>
> —George Bernard Shaw
> *Irish Playwright, 20th Century*

FIGURE **14.5**

PERCENTAGE OF MARRIED PERSONS AGE 18 AND OLDER WITH "VERY HAPPY" MARRIAGES



Cross-Cultural Comparisons Many aspects of marriage vary across cultures. For example, as part of China's efforts to control population growth, a 1981 law sets the minimum age for marriage at 22 years for males, 20 for females.

The traits that people look for in a marriage partner vary around the world. In one large-scale study of 9,474 adults from 37 cultures on six continents and five islands, people varied most regarding how much they valued chastity—desiring a marital partner with no previous experience in sexual intercourse (Buss & others, 1990). Chastity was the most important characteristic in selecting a marital partner in China, India, Indonesia, Iran, Taiwan, and the Palestinian Arab culture. Adults from Ireland and Japan placed moderate importance on chastity. In contrast, adults in Sweden, Finland, Norway, the Netherlands, and Germany generally said that chastity was not important in selecting a marital partner.

Domesticity is also valued in some cultures and not in others. In this study, adults from the Zulu culture in South Africa, Estonia, and Colombia placed a high value on housekeeping skills in their marital preference. By contrast, adults in the United States, Canada, and all western European countries except Spain said that housekeeping skill was not an important trait in their partner.

Religion plays an important role in marriage in many cultures. For example, Islam stresses the honor of the male and the purity of the female. It also emphasizes the woman's role in childbearing, child rearing, educating children, and instilling the Islamic faith in their children. In India, more than 70 percent of marriages continue to be arranged. However, as more women have entered the workforce in India and moved from rural areas to cities, these Indian women increasingly resist an arranged marriage.

International comparisons of marriage also reveal that individuals in Scandinavian countries marry later than Americans, whereas their counterparts in many

(*a*) In Scandinavian countries, cohabitation is popular; only a small percentage of 20- to 24-year-olds are married. (*b*) Islam stresses male honor and female purity. (*c*) Japanese young adults live at home longer with their parents before marrying than young adults in most other countries.

(*a*) (*b*) (*c*)

African, Asian, and Latin American countries marry younger (Waite, 2009). In Denmark, for example, almost 80 percent of the women and 90 percent of the men aged 20 to 24 have never been married. In Hungary, less than 40 percent of the women and 70 percent of the men the same age have never been married. In Scandinavian countries, cohabitation is popular among young adults; however, most Scandinavians eventually marry (Popenoe, 2007). In Sweden, on average women delay marriage until they are 31, men until they are 33. Some countries, such as Hungary, encourage early marriage and childbearing to offset declines in the population. Like Scandinavian countries, Japan has a high proportion of unmarried young people. However, rather than cohabiting as the Scandinavians do, unmarried Japanese young adults live at home longer with their parents before marrying.

Premarital Education An increasing number of emerging and young adults are obtaining premarital education that provides information about relationships (Busby & others, 2007). Might premarital education improve the quality of a marriage and possibly reduce the chances that the marriage will end in a divorce? A recent survey of more than 3,000 adults revealed that premarital education was linked to a higher level of marital satisfaction and commitment to a spouse, a lower level of destructive marital conflict, and a 31 percent lower likelihood of divorce (Stanley & others, 2006). The premarital education programs in the study ranged from several hours to 20 hours with a median of 8 hours. It is recommended that premarital education begin approximately six months to a year before the wedding.

The Benefits of a Good Marriage Are there any benefits to having a good marriage? There are. Individuals who are happily married live longer, healthier lives than either divorced individuals or those who are unhappily married (Waite, 2009; Wilson & Smallwood, 2008). A recent study assessed 94,000 Japanese, 40 to 79 years of age, on two occasions: at the beginning of the study and approximately 10 years later (Ikeda & others, 2007). Compared with never-married individuals, those who were married had a lower risk of dying in the 10-year period. An unhappy marriage can shorten a person's life by an average of 4 years (Gove, Style, & Hughes, 1990). And a recent study indicated that the longer women were married, the less likely they were to develop a chronic health condition and the longer that men were married, the lower their risk was of developing a disease (Dupre & Meadows, 2007).

What are the reasons for these benefits of a happy marriage? People in happy marriages likely feel less physically and emotionally stressed, which puts less wear and tear on a person's body. Such wear and tear can lead to numerous physical ailments, such as high blood pressure and heart disease, as well as psychological problems such as anxiety, depression, and substance abuse.

DIVORCED ADULTS

Divorce has become epidemic in the United States (Hoelter, 2009). The number of divorced adults rose from 1.8 percent of the adult population in 1960 to 4.8 percent in 1980 to 8.6 percent in 2007 (Popenoe, 2009). Figure 14.6 shows the percentage of divorced men and women in the United States in 1950 and 2007 (Popenoe, 2009). The divorce rate increasing considerably from 1960 to 1980, then gradually declined from the early 1980s to 2005, but recently increased from 2005 to 2007 (Popenoe, 2009).

Although divorce has increased for all socioeconomic groups, those in some groups have a higher incidence of divorce (Amato, 2010). Youthful marriage, low educational level, low income, not having a religious affiliation, having parents who are divorced, and having a baby before marriage are factors that are associated with increases in divorce (Hoelter, 2009). And these characteristics of one's partner increase the

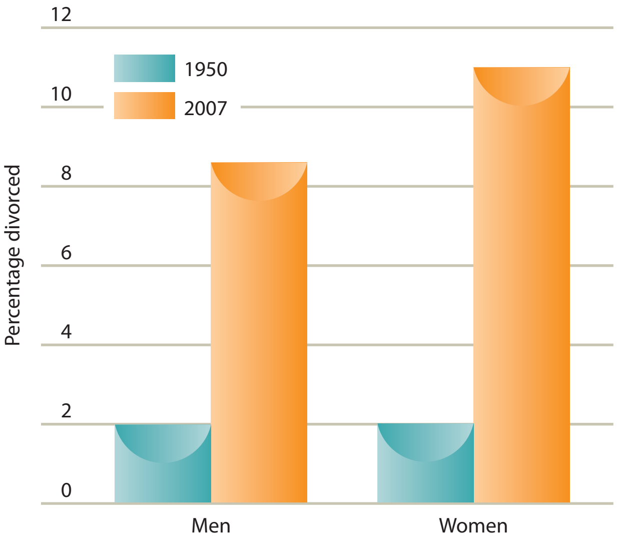


FIGURE **14.6**

PERCENTAGE OF DIVORCED U.S. MEN AND WOMEN: 1950 AND 2007. *Why do you think more women are divorced than men?*

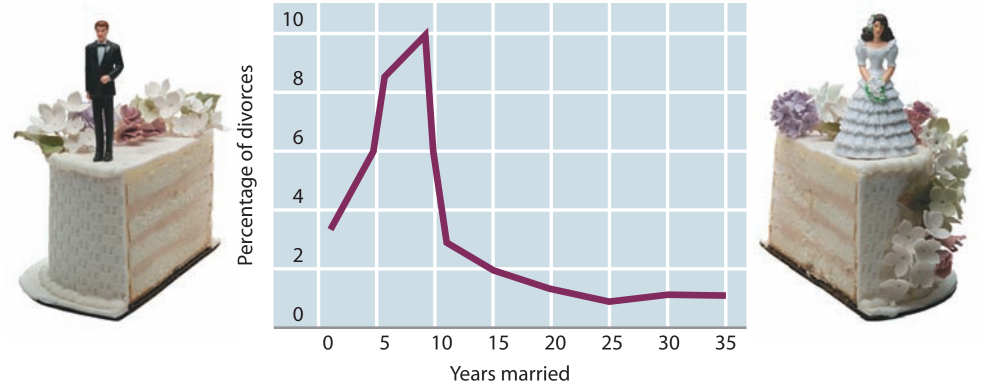


FIGURE **14.7**

THE DIVORCE RATE IN RELATION TO NUMBER OF YEARS MARRIED. Shown here is the percentage of divorces as a function of how long couples have been married. Notice that most divorces occur in the early years of marriage, peaking in the fifth to tenth years of marriage.

likelihood of divorce: alcoholism, psychological problems, domestic violence, infidelity, and inadequate division of household labor (Hoelter, 2009).

Earlier, we indicated that researchers have not been able to pin down a specific age that is the best time to marry so that the marriage is unlikely to end in a divorce. However, if a divorce is going to occur, it usually takes place early in a marriage; most occur in the 5th to 10th year of marriage (National Center for Health Statistics, 2000) (see Figure 14.7). This timing may reflect an effort by partners in troubled marriages to stay in the marriage and try to work things out. If after several years these efforts don't improve the relationship, they may then seek a divorce.

developmental **connection**

Family and Peers. Children in divorced families have more adjustment problems than children in never-divorced intact families, but a majority of children in divorced families do not have adjustment problems. Chapter 8, p. 261

Both partners experience challenges after a marriage dissolves (Eidar-Avidan, Haj-Yahia, & Greenbaum, 2009; Hoelter, 2009). Both divorced women and divorced men complain of loneliness, diminished self-esteem, anxiety about the unknowns in their lives, and difficulty in forming satisfactory new intimate relationships (Hetherington, 2006). A recent study revealed that following marital dissolution, both men and women were more likely to experience an episode of depression than individuals who remained with a spouse over a two-year period (Rotermann, 2007). And a recent Swedish study found that divorced adults were more likely to smoke daily than married or cohabiting adults (Lindstrom, 2010).

Despite all of these stresses and challenges, many people do cope effectively with divorce. Later in this chapter, we consider the varied paths people take after a divorce and suggested strategies for coping.

REMARRIED ADULTS

Adults who remarry usually do so rather quickly with approximately 50 percent remarrying within three years after their divorce (Sweeney, 2009, 2010). Men remarry sooner than women. Men with higher incomes are more likely to remarry than their counterparts with lower incomes. Remarriage occurs sooner for partners who initiate a divorce (especially in the first several years after divorce and for older women) than those who do not (Sweeney, 2009, 2010).

Evidence on the benefits of remarriage on adults is mixed. Remarried families are more likely to be unstable than first marriages with divorce more likely to occur, especially in the first several years of the remarried family, than in first marriages (Waite, 2009). Adults who get remarried have a lower level of mental health (higher rates of depression, for example) than adults in first marriages, but remarriage often improves the financial status of remarried adults, especially women (Waite, 2009). Researchers have found that remarried adults' marital relationship is more egalitarian and more likely to be characterized by shared decision making than first marriages (Waite, 2009). Remarried wives also report that they have more influence on financial matters in their new family than do wives in first marriages (Waite, 2009).

Stepfamilies come in many sizes and forms (Anderson & Sabatelli, 2007). The custodial and noncustodial parents and stepparent all might have been married and divorced, in some cases more than once. These parents might have residential children from prior marriages and a large network of grandparents and other relatives. Approximately 50 percent of remarried women bear children within their newly formed union, although the presence of stepchildren from a prior marriage reduces the likelihood of childbearing with the new husband (Waite, 2009).

As indicated earlier, remarried adults often find it difficult to stay remarried. Why? For one thing, many remarry not for love but for financial reasons, for help in rearing children, and to reduce loneliness. They also might carry into the stepfamily negative patterns that produced failure in an earlier marriage. Remarried couples also experience more stress in rearing children than parents in never-divorced families (Ganong, Coleman, & Hans, 2006).

GAY AND LESBIAN ADULTS

The legal and social context of marriage creates barriers to breaking up that do not usually exist for same-sex partners (Biblarz & Savci, 2010; Green & Mitchell, 2009). But in other ways, researchers have found that gay and lesbian relationships are similar—in their satisfactions, loves, joys, and conflicts—to heterosexual relationships (Mohr, 2008). For example, like heterosexual couples, gay and lesbian couples need to find the balance of romantic love, affection, autonomy, and equality that is acceptable to both partners (Kurdek, 2006). An increasing number of gay and lesbian couples are creating families that include children (see Figure 14.8).

Lesbian couples especially place a high priority on equality in their relationships (Peplau & Fingerhut, 2007). Indeed, some researchers have found that gay and lesbian couples are more flexible in their gender roles than heterosexual individuals are (Marecek, Finn, & Cardell, 1988). And a recent study of couples revealed that over the course of 10 years of cohabitation, partners in gay and lesbian relationships showed a higher average level of relationship quality than heterosexual couples (Kurdek, 2007).

There are a number of misconceptions about gay and lesbian couples (Biblarz & Savci, 2010; Hope, 2009; Peplau & Fingerhut, 2007). Contrary to stereotypes, one partner is masculine and the other feminine in only a small percentage of gay and lesbian couples. Only a small segment of the gay population has a large number of sexual partners, and this is uncommon among lesbians. Furthermore, researchers have found that gays and lesbians prefer long-term, committed relationships (Peplau & Fingerhut, 2007). About half of committed gay couples do have an open relationship that allows the possibility of sex (but not affectionate love) outside the relationship. Lesbian couples usually do not have this open relationship.

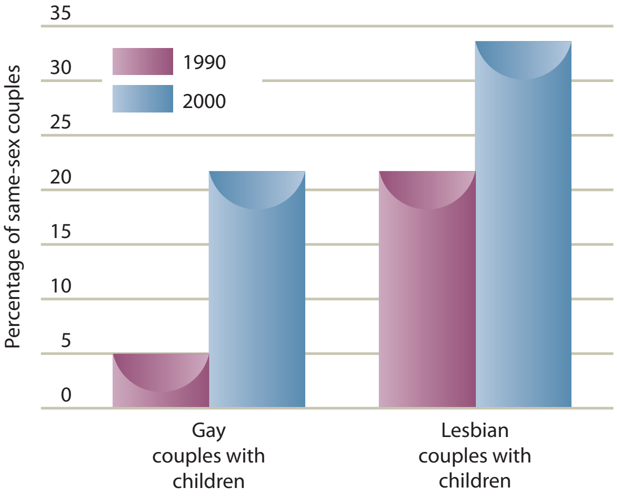


FIGURE **14.8**

PERCENTAGE OF GAY AND LESBIAN COUPLES WITH CHILDREN: 1990 AND 2000. *Why do you think more lesbian couples have children than gay couples?*

developmental **connection**

Parenting. Researchers have found few differences between children who are being raised by gay and lesbian parents and children who are being raised by heterosexual parents. Chapter 8, p. 262

Review *Connect* Reflect

LG3 Characterize adult lifestyles.

Review

- What are characteristics of the lives of single adults?
- What are key features of the lives of cohabiting adults?
- What are current marital trends?
- How does divorce affect adults?
- What are the lives of remarried parents like?
- How are gay and lesbian couples like or unlike heterosexual couples?

Connect

- What did you learn in Chapter 8 about the effects of divorce and remarriage on the children in those families?

Reflect *Your Own Personal Journey of Life*

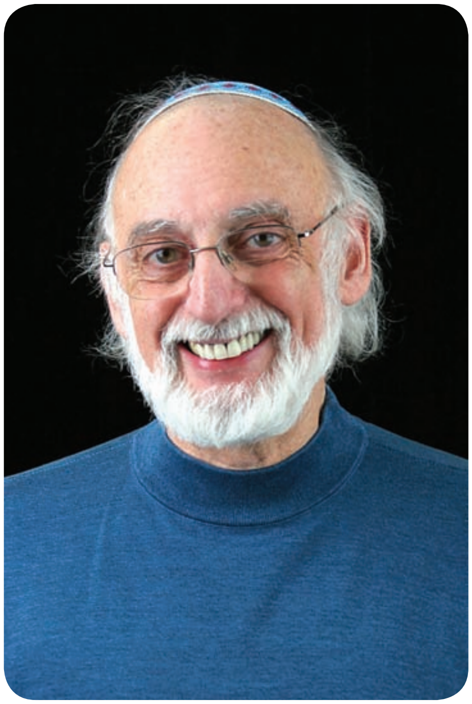
- Which type of lifestyle are you living today? What do you think are the advantages and disadvantages of this lifestyle for you? If you could have a different lifestyle, which one would it be? Why?

4 Marriage and the Family

LG4 Discuss making marriage work, parenting, and divorce.

Making Marriage Work | Becoming a Parent | Dealing With Divorce

Whatever lifestyles young adults choose, they will bring certain challenges. Because many choose the lifestyle of marriage, we'll consider some of the challenges in marriage and how to make it work. We also examine some challenges in parenting and trends in childbearing. Given the statistics about divorce rates in the previous section, we'll then consider how to deal with divorce.



John Gottman, who has conducted extensive research on what makes marriages work.

> Unlike most approaches to helping couples, mine is based on knowing what makes marriages succeed rather than fail.
>
> —**John Gottman**
>
> *Contemporary Psychologist, University of Washington*

MAKING MARRIAGE WORK

John Gottman (1994, 2006; Gottman & Gottman, 2009; Gottman, Gottman, & Declaire, 2006) has been studying married couples' lives since the early 1970s. He uses many methods to analyze what makes marriages work. Gottman interviews couples about the history of their marriage, their philosophy about marriage, and how they view their parents' marriages. He videotapes them talking to each other about how their day went and evaluates what they say about the good and bad times of their marriages. Gottman also uses physiological measures to measure their heart rate, blood flow, blood pressure, and immune functioning moment by moment. He also checks back with the couples every year to see how their marriage is faring. Gottman's research represents the most extensive assessment of marital relationships available. Currently, he and his colleagues are following 700 couples in seven studies.

Gottman argues that it is important to realize that love is not something magical and that through knowledge and effort couples can improve their relationship. In his research, Gottman has found that seven main principles determine whether a marriage will work:

- *Establish love maps*. Individuals in successful marriages have personal insights and detailed maps of each other's life and world. They aren't psychological strangers. In good marriages, partners are willing to share their feelings with each other. They use these "love maps" to express not only their understanding of each other but also their fondness and admiration.
- *Nurture fondness and admiration.* In successful marriages, partners sing each other's praises. More than 90 percent of the time, when couples put a positive spin on their marriage's history, the marriage is likely to have a positive future.
- *Turn toward each other instead of away.* In good marriages, spouses are adept at turning toward each other regularly. They see each other as friends. This friendship doesn't keep arguments from occurring, but it can prevent differences from overwhelming the relationship. In these good marriages, spouses respect each other and appreciate each other's point of view despite disagreements.
- *Let your partner influence you*. Bad marriages often involve one spouse who is unwilling to share power with the other. Although power-mongering is more common in husbands, some wives also show this trait. A willingness to share power and to respect the other person's view is a prerequisite to compromising. One study revealed that equality in decision making was one of the main factors that predicted positive marriage quality (Amato, 2007).
- *Solve solvable conflicts*. Two types of problems occur in marriage: (1) perpetual and (2) solvable. Perpetual problems are the type that do not go away and may include differences about whether to have children and how often to have sex. Solvable problems can be worked out and may include such things as not helping each other reduce daily stresses and not being verbally affectionate. Unfortunately, more than two-thirds of marital problems fall

into the perpetual category. Fortunately, marital therapists have found that couples often don't have to solve their perpetual problems for the marriage to work.

In his research, Gottman has found that to resolve conflicts, couples should start out with a soft rather than a harsh approach, try to make and receive "repair attempts," regulate their emotions, compromise, and be tolerant of each other's faults. Conflict resolution is not about one person making changes; it is about negotiating and accommodating each other.

- *Overcome gridlock*. One partner wants the other to attend church; the other is an atheist. One partner is a homebody; the other wants to go out and socialize a lot. Such problems often produce gridlock. Gottman believes the key to ending gridlock is not to solve the problem, but to move from gridlock to dialogue and be patient.
- *Create shared meaning*. The more partners can speak candidly and respectfully with each other, the more likely it is that they will create shared meaning in their marriage. This also includes sharing goals with one's spouse and working together to achieve each other's goals.

What makes marriages work? What are the benefits of having a good marriage?

In addition to Gottman's view, other experts on marriage argue that such factors as forgiveness and commitment are important aspects of a successful marriage (Fincham, Stanley, & Beach, 2007). These factors function as self-repair processes in healthy relationships. For example, spouses may have a heated argument that has the potential to harm their relationship (Amato, 2007). After calming down, they may forgive each other and repair the damage. A recent study of spouses who reported a significant betrayal revealed that holding a grudge and wanting revenge was linked with lower marital satisfaction for husbands and wives, while forgiveness that involved increased understanding of one's partner and decreased anger about betrayal was related to developing a more positive parenting alliance (Gordon & others, 2009).

Spouses who have a strong commitment to each other may in times of conflict sacrifice their personal self-interest for the benefit of the marriage. Commitment especially becomes important when a couple is not happily married and can help them get through hard times with the hope that the future will involve more positive changes in the relationship.

For remarried couples, strategies for coping with the stress of living in a stepfamily include these (Visher & Visher, 1989):

- *Have realistic expectations*. Allow time for loving relationships to develop, and look at the complexity of the stepfamily as a challenge to overcome.
- *Develop new positive relationships within the family*. Create new traditions and ways of dealing with difficult circumstances. Allocation of time is especially important because so many people are involved. The remarried couple needs to allot time alone for each other.

BECOMING A PARENT

For many young adults, parental roles are well planned, coordinated with other roles in life, and developed with the individual's economic situation in mind. For others, the discovery that they are about to become parents is a startling surprise. In either event, the prospective parents may have mixed emotions and romantic illusions about having a child.

> We never know the love of our parents until we have become parents.
>
> —Henry Ward Beecher
>
> *American Clergyman, 19th Century*

Parenting Myths and Reality The needs and expectations of parents have stimulated many myths about parenting (DeGenova & Rice, 2008). These parenting myths include:

- The birth of a child will save a failing marriage.
- As a possession or extension of the parent, the child will think, feel, and behave as the parent did in his or her childhood.

connecting with careers

Janis Keyser, Parent Educator

Janis Keyser is a parent educator who teaches in the Department of Early Childhood Education at Cabrillo College in California. In addition to teaching college classes and conducting parenting workshops, she also has coauthored a book with Laura Davis (1997): *Becoming the Parent You Want to Be: A Source-Book of Strategies for the First Five Years.*

Keyser also writes as an expert on the iVillage Web site (www.parentsplace.com), and she co-authors a nationally syndicated parenting column, "Growing Up, Growing Together." Keyser is the mother of three, stepmother of five, grandmother of twelve, and great-grandmother of six.

Janis Keyser (*right*), conducting a parenting workshop.

developmental **connection**

Parenting. For most families, an authoritative parenting style is linked to more positive behavior on the part of children than authoritarian, indulgent, and neglectful styles. Chapter 8, p. 254

- Having a child gives the parents a "second chance" to achieve what they should have achieved.
- Parenting is an instinct and requires no training.

Parenting requires a number of interpersonal skills and imposes emotional demands, yet there is little in the way of formal education for this task. Most parents learn parenting practices from their own parents—some they accept, some they discard. Unfortunately, when methods of parents are passed on from one generation to the next, both desirable and undesirable practices are perpetuated. Adding to the reality of the task of parenting, husbands and wives may bring different parenting practices to the marriage. The parents, then, may struggle with each other about which is a better practice to interact with a child.

Parent educators seek to help individuals to become better parents. To read about the work of one parent educator, see *Connecting With Careers.*

What are some parenting myths?

Trends in Childbearing Like marriage, the age at which individuals have children has been increasing (Morgan, 2009). In 2005, the average age at which women gave birth for the first time was a record high 25.2 years of age, up from 21 years of age in 2001 (Joint Economics Committee, 2007).

As birth control has become common practice, many individuals consciously choose when they will have children and how many children they will rear. The number of one-child families is increasing, for example, and U.S. women overall are having fewer children. These childbearing trends are creating several trends:

- By giving birth to fewer children and reducing the demands of child care, women free up a significant portion of their life spans for other endeavors.
- Men are apt to invest a greater amount of time in fathering.
- Parental care is often supplemented by institutional care (child care, for example).

As more women show an increased interest in developing a career, they are not only marrying later, but also having fewer children and having them later in life. What are some of the advantages of having children early or late? Some of the advantages of having children early (in the twenties) are that the parents are likely to have more physical energy (for example, they can cope better with such matters as getting up in the middle of the night with infants and waiting up until adolescents come home at night); the mother is likely to have fewer medical problems with pregnancy and childbirth; and the parents may be less likely to build up expectations for their children, as do many couples who have waited many years to have children.

There are also advantages to having children later (in the thirties): The parents will have had more time to consider their goals in life, such as what they want from their family and career roles; the parents will be more mature and will be able to benefit from their life experiences to engage in more competent parenting; and the parents will be better established in their careers and have more income for child-rearing expenses.

DEALING WITH DIVORCE

If a marriage doesn't work, what happens after divorce? Psychologically, one of the most common characteristics of divorced adults is difficulty in trusting someone else in a romantic relationship. Following a divorce, though, people's lives can take diverse turns (Hoelter, 2009). In E. Mavis Hetherington's research, men and women took six common pathways in exiting divorce (Hetherington & Kelly, 2002, pp. 98–108):

- *The enhancers*. Accounting for 20 percent of the divorced group, most were females who "grew more competent, well-adjusted, and self-fulfilled" following their divorce (p. 98). They were competent in multiple areas of life, showed a remarkable ability to bounce back from stressful circumstances, and create something meaningful out of problems.
- *The good-enoughs*. The largest group of divorced individuals, they were described as average people coping with divorce. They showed some strengths and some weaknesses, some successes and some failures. When they experienced a problem, they tried to solve it. Many of them attended night classes, found new friends, developed active social lives, and were motivated to get higher-paying jobs. However, they were not as good at planning and were less persistent than the enhancers. Good-enough women usually married men who educationally and economically were similar to their first husbands, often going into a new marriage that was not much of an improvement over the first one.
- *The seekers*. These individuals were motivated to find new mates as soon as possible. "At one year post-divorce, 40 percent of the men and 38 percent of women had been classified as seekers. But as people found new partners or remarried, or became more secure or satisfied in their single life, this category shrank and came to be predominated by men" (p. 102).
- *The libertines*. People in this category often spent more time in singles bars and had more casual sex than their counterparts in the other divorce categories. However, by the end of the first year post-divorce, they often grew disillusioned with their sensation-seeking lifestyle and wanted a stable relationship.
- *The competent loners*. These individuals, which made up only about 10 percent of the divorced group, were "well-adjusted, self-sufficient, and socially skilled." They had a successful career, an active social life, and a wide range of interests. However, "unlike enhancers, competent loners had little interest in sharing their lives with anyone else" (p. 105).
- *The defeated*. Some of these individuals had problems before their divorce, and these problems increased after the breakup when "the added stress of a failed marriage was more than they could handle. Others had difficulty coping because divorce cost them a spouse who had supported them, or in the case of a drinking problem, restricted them" (p. 106).

To read about some guidelines for coping and adapting in the aftermath of divorce, see *Connecting Development to Life*.

connecting development to life

Coping and Adapting in the Aftermath of Divorce

Hetherington recommends these strategies for divorced adults (Hetherington & Kelly, 2002):

- Think of divorce as a chance to grow personally and to develop more positive relationships.
- Make decisions carefully. The consequences of your decision making regarding work, lovers, and children may last a lifetime.
- Focus more on the future than the past. Think about what is most important for you going forward in your life, set some challenging goals, and plan how to reach them.
- Use your strengths and resources to cope with difficulties.
- Don't expect to be successful and happy in everything you do. "The road to a more satisfying life is bumpy and will have many detours" (p. 109).
- Remember that "you are never trapped by one pathway. Most of those who were categorized as defeated immediately after divorce gradually moved on to a better life, but moving onward usually requires some effort" (p. 109).

Look back again at the six common pathways for exiting divorce that Hetherington proposes. Describe how someone on each of those pathways might particularly benefit from employing one or another of these strategies.

Review *Connect* Reflect

LG4 Discuss making marriages work, parenting, and divorce.

Review

- What makes a marriage work?
- What are some current trends in childbearing?
- What paths do people take after a divorce?

Connect

- In this section, you read about some of the advantages of having children early or late in one's life. What did you learn about maternal age in Chapter 3?

Reflect *Your Own Personal Journey of Life*

- What do you think would be the best age to have children? Why?

5 Gender, Relationships, and Self-Development

LG5 Summarize the role of gender in relationships.

Gender and Communication | Women's Development | Men's Development

Stereotypes about differences in men's and women's attitudes toward communication and about differences in how they communicate with each other have spawned countless cartoons and jokes. Are the supposed differences real? In this section, we will explore the answer to this question and also consider some aspects of both the woman's role and the man's role in relationships.

GENDER AND COMMUNICATION

When Deborah Tannen (1990) analyzed the talk of women and men, she found that many wives complain about their husbands that "He doesn't listen to me anymore" and "He doesn't talk to me anymore." Lack of communication, though high on women's lists of reasons for divorce, is mentioned much less often by men.

Understanding the other's ways of talking is a giant leap across the communication gap between women and men, and a giant step toward opening lines of communication.

—Deborah Tannen

Contemporary Sociologist, Georgetown University

Communication problems between men and women may come in part from differences in their preferred ways of communicating (Gamble & Gamble, 2008). Tannen distinguishes two ways of communications: rapport talk and report talk. **Rapport talk** is the language of conversation; it is a way of establishing connections and negotiating relationships. **Report talk** is talk that is designed to give information, which includes public speaking. According to Tannen, women enjoy rapport talk more than report talk, and men's lack of interest in rapport talk bothers many women. In contrast, men prefer to engage in report talk. Men hold center stage through such verbal performances as telling stories and jokes. They learn to use talk as a way of getting and keeping attention.

How extensive are the gender differences in communication? Research has yielded somewhat mixed results. Several studies do reveal some gender differences (Anderson, 2006). One study of a sampling of students' e-mails found that people could guess the writer's gender two-thirds of the time (Thompson & Murachver, 2001). Another study revealed that women make 63 percent of phone calls and when talking to another woman stay on the phone longer (7.2 minutes) than men do when talking with other men (4.6 minutes) (Smoreda & Licoppe, 2000). However, meta-analyses suggest that overall gender differences in communication are small for both children and adults (Hyde, 2005, 2007; Leaper & Smith, 2004). Further, a recent analysis revealed no gender differences in the average number of total words spoken by seven different samples of college men and women over 17 waking hours (Mehl & others, 2007).

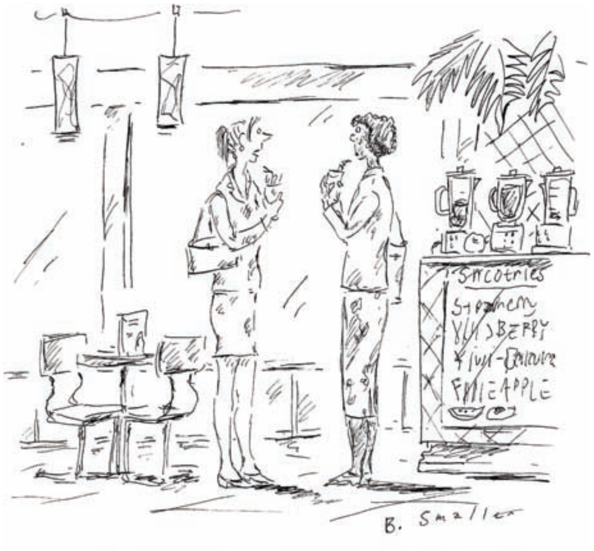
A thorough recent study documented some gender differences in specific aspects of communication (Newman & others, 2008). In this study, women used words more for discussing people and what they were doing, as well as for communicating internal processes to others, including expression of doubts. By contrast, men used words more for external events, objects, and processes, including occupation, money, sports, and swearing. Contrary to popular stereotypes, men and women could not be distinguished in their reference to sexuality and anger. Thus, while gender similarity likely characterizes communication in general, as just indicated, there do seem to be some gender differences in certain aspects of communication.

"You have no idea how nice it is to have someone to talk to."
Copyright © 1994 by Don Orehek.

WOMEN'S DEVELOPMENT

Tannen's analysis of women's preference for rapport talk suggests that women place a high value on relationships and focus on nurturing their connections with others. This view echoes some ideas of Jean Baker Miller (1986), who has been an important voice in stimulating the examination of psychological issues from a female perspective. Miller argues that when researchers examine what women have been doing in life, a large part of it is active participation in the development of others. In Miller's view, women often try to interact with others in ways that will foster the other person's development along many dimensions—emotionally, intellectually, and socially.

Most experts believe it is important for women to not only maintain their competency in relationships but also to be self-motivated (Hyde, 2007; Matlin, 2008). As Harriet Lerner (1989) concludes in her book *The Dance of Intimacy,* it is important for women to bring to their relationships nothing less than a strong, assertive, independent, and authentic self. She emphasizes that competent relationships are those in which the separate "I-ness" of both persons can be appreciated and enhanced while still staying emotionally connected to each other.



"Sex brought us together, but gender drove us apart."
© Barbara Smaller/The New Yorker Collection/www.cartoonbank.com

In sum, Miller, Tannen, and other gender experts such as Carol Gilligan, whose ideas you read about in Chapter 10, believe that women are more relationship-oriented than men—and that this relationship orientation should be prized as a skill in our culture more than it currently is. Critics of this view of gender differences in relationships contend that it is too stereotypical (Dindia, 2005; Hyde, 2007). They

rapport talk The language of conversation; it is a way of establishing connections and negotiating relationships.

report talk Talk that is designed to give information and includes public speaking.

argue that there is greater individual variation in the relationship styles of men and women than this view acknowledges.

MEN'S DEVELOPMENT

The male of the species—what is he really like? What are his concerns? According to Joseph Pleck's (1995) *role-strain view,* male roles are contradictory and inconsistent. Men not only experience stress when they violate men's roles, they also are harmed when they do act in accord with men's roles. Here are some of the areas where men's roles can cause considerable strain (Levant, 2002):

How might men be able to reconstruct their masculinity in positive ways?

- *Health*. Men live five years less than women do. They have higher rates of stress-related disorders, alcoholism, car accidents, and suicide. Men are more likely than women to be the victims of homicide. In sum, the male role is hazardous to men's health.
- *Male-female relationships*. Too often, the male role involves expectations that men should be dominant, powerful, and aggressive and should control women. "Real men," according to many traditional definitions of masculinity, look at women in terms of their bodies, not their minds and feelings, have little interest in rapport talk and relationships, and do not consider women equal to men in work or many other aspects of life. Thus the traditional view of the male role encourages men to disparage women, be violent toward women, and refuse to have equal relationships with women.
- *Male-male relationships*. Too many men have had too little interaction with their fathers, especially fathers who are positive role models. Nurturing and being sensitive to others have been considered aspects of the female role, not the male role. And the male role emphasizes competition rather than cooperation. All of these aspects of the male role have left men with inadequate positive, emotional connections with other males.

To reconstruct their masculinity in more positive ways, Ron Levant (2002) suggests that every man should (1) reexamine his beliefs about manhood, (2) separate out the valuable aspects of the male role, and (3) get rid of those parts of the masculine role that are destructive. All of this involves becoming more "emotionally intelligent"—that is, becoming more emotionally self-aware, managing emotions more effectively, reading emotions better (one's own emotions and others'), and being motivated to improve close relationships.

developmental **connection**

Gender. Many fathers interact with infants differently than mothers do. Chapter 6, p. 198

Review *Connect* Reflect

LG5 Summarize the role of gender in relationships.

Review

- What are some differences in how men and women communicate?
- What are some important aspects of the woman's role in relationships?
- What are some important aspects of the man's role in relationships?

Connect

- In this section, you read about some of the gender role expectations men face in their lives. How does this relate to Pollack's "boy code" concept, which you read about in Chapter 10?

Reflect *Your Own Personal Journey of Life*

- If you are a woman, how would you like the men in your relationships today to change? If you are a man, how would you like the women in your relationships today to change?

topical **connections**

Middle adulthood is a time when individuals experience Erikson's seventh life-span stage, generativity versus stagnation. In this stage, it is important for middle-aged adults to contribute in meaningful ways to the next generation. In Levinson's theory, one of the key conflicts of middle age involves coping with the young-old polarity in life. Mid-life crises are not as common as believed by many; however, when they occur, negative life events usually are involved. A number of longitudinal studies of stability and change in adult development have been conducted and recently it has been argued that stability peaks in middle adulthood. Affectionate love increases in middle age. Many middle-aged adults become grandparents. Middle-aged women especially play an important role in connecting generations.

*looking **forward***

reach your **learning goals**

Socioemotional Development in Early Adulthood

1 Stability and Change From Childhood to Adulthood

LG1 Describe stability and change in temperament, and summarize adult attachment styles.

Temperament

- Links between childhood temperament and adult personality can vary, depending on contexts in an individual's experience. A high activity level in early childhood is linked with being an outgoing young adult. Young adults show fewer mood swings, are more responsible, and engage in less risk taking than adolescents. In some cases, certain dimensions of temperament in childhood are linked with adjustment problems in early adulthood.

Attachment

- Three adult attachment styles are secure attachment, avoidant attachment, and anxious attachment. Attachment styles in early adulthood are linked with a number of relationship patterns and developmental outcomes. For example, securely attached adults often show more positive relationship patterns than insecurely attached adults. Also, adults with avoidant and anxious attachment styles tend to be more depressed and have more relationship problems than securely attached adults.

2 Attraction, Love, and Close Relationships

LG2 Identify some key aspects of attraction, love, and close relationships.

Attraction

- Familiarity precedes a close relationship. We like to associate with people who are similar to us. The principles of consensual validation and matching can explain this. Similarity in personality attributes may be especially important in a relationship's success. The criteria for physical attractiveness vary across cultures and historical time.

The Faces of Love

- The different types of love include friendship, romantic love, affectionate love, and consummate love. Friendship plays an important role in adult development, especially in terms of emotional support. Romantic love, also called passionate love, includes passion, sexuality, and a mixture of emotions, not all of which are positive. Affectionate love, also called companionate love, usually becomes more important as relationships mature. Shaver proposed a developmental model of love and Sternberg a triarchic model of love (passion, intimacy, and commitment).

Falling Out of Love

- The collapse of a close relationship can be traumatic, but for some individuals it results in happiness and personal development. For most individuals, falling out of love is painful and emotionally intense.

3 Adult Lifestyles

LG3 Characterize adult lifestyles.

Single Adults

- Being single has become an increasingly prominent lifestyle. Autonomy is one of its advantages. Intimacy, loneliness, and finding a positive identity in a marriage-oriented society are challenges faced by single adults.

Cohabiting Adults

- Cohabitation is an increasingly popular lifestyle but researchers have found it is often linked to negative marital outcomes, although this link depends on the timing of cohabitation. Negative marital outcomes are more likely when cohabitation occurs prior to becoming engaged.

Married Adults

- The age at which individuals marry in the United States is increasing. Despite a decline in marriage rates, a large percentage of Americans still marry. The benefits of marriage include better physical and mental health and a longer life.

Divorced Adults

- The U.S. divorce rate increased dramatically in the 20th century but began to decline in the 1980s. Divorce is complex and emotional. Both divorced men and women can experience loneliness, anxiety, and difficulty in forming new relationships.

Remarried Adults

- When adults remarry, they tend to do so rather quickly with men remarrying sooner than women. Remarriage confers some benefits on adults but also some problems. Remarried families are less stable than first marriages and remarried adults have a lower level of mental health than adults in first marriages, although remarriage improves adults' (especially women's) financial status. Stepfamilies come in many sizes and forms.

Gay and Lesbian Adults

- One of the most striking findings about gay and lesbian couples is how similar their relationships are to heterosexual couples' relationships.

4 Marriage and the Family

LG4 Discuss making marriages work, parenting, and divorce.

Making Marriage Work

- Gottman's research indicates that in marriages that work couples establish love maps, nurture fondness and admiration, turn toward each other, accept the influence of the partner, solve solvable conflicts, overcome gridlock, and create shared meaning.

Becoming a Parent

- Families are becoming smaller, and many women are delaying childbirth until they have become well established in a career. There are some advantages to having children earlier in adulthood, and some advantages to having them later.

Dealing with Divorce

- Hetherington identified six pathways taken by people after divorce: enhancers, good-enoughs, seekers, libertines, competent loners, and the defeated. About 20 percent became better adjusted and more competent after the divorce.

5 Gender, Relationships, and Self-Development

LG5 Summarize the role of gender in relationships.

Gender and Communication

- Tannen distinguishes between rapport talk, which many women prefer, and report talk, which many men prefer. Meta-analyses have found small gender differences in overall communication, but recent research suggests some gender differences in specific aspects of communication, such as the way men and women use words.

Women's Development

- Some gender experts contend that women are more relationship-oriented than men and that their interactions focus on fostering the development of other people. Critics argue that there is more individual variation in women's and men's relationship styles than this view acknowledges. Many experts believe that it is important for women to retain their competence in relationships, but also to be self-motivated.

Men's Development

- The traditional male role involves considerable strain, which takes a toll on men's health. The role also discourages equal relationships with women, and discourages positive emotional connections with other men.

key terms

secure attachment style 448
avoidant attachment style 448
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section **eight**

> *Generations will depend on the ability of every procreating individual to face his children.*
>
> —**Erik Erikson**
> *American Psychologist, 20th Century*

Middle Adulthood

In middle adulthood, what we have been forms what we will be. For some of us, middle age is such a foggy place, a time when we need to discover what we are running from and to and why. We compare our life with what we vowed to make it. In middle age, more time stretches before us, and some evaluations, however reluctant, have to be made. As the young-old polarity greets us with a special force, we need to join the daring youth with the discipline of age in a way that does justice to both. As middle-aged adults, we come to sense that the generations of living things pass in a short while and, like runners, hand on the torch of life. Section 8 consists of two chapters: "Physical and Cognitive Development in Middle Adulthood" (Chapter 15) and "Socioemotional Development in Middle Adulthood" (Chapter 16).

chapter 15

PHYSICAL AND COGNITIVE DEVELOPMENT IN MIDDLE ADULTHOOD

chapter **outline**

1 The Nature of Middle Adulthood

Learning Goal 1 Explain how midlife is changing, and define middle adulthood.

Changing Midlife
Defining Middle Adulthood

2 Physical Development

Learning Goal 2 Discuss physical changes in middle adulthood.

Physical Changes
Health and Disease
Mortality Rates
Sexuality

3 Cognitive Development

Learning Goal 3 Identify cognitive changes in middle adulthood.

Intelligence
Information Processing

4 Careers, Work, and Leisure

Learning Goal 4 Characterize career development, work, and leisure in middle adulthood.

Work in Midlife
Career Challenges and Changes
Leisure

5 Religion and Meaning in Life

Learning Goal 5 Explain the roles of religion and meaning in life during middle adulthood.

Religion and Adult Lives
Religion and Health
Meaning in Life

Our perception of time depends on where we are in the life span. We are more concerned about time at some points in life than others (Schroots, 2007).

Jim Croce's song "Time in a Bottle" reflects a time perspective that develops in the adult years:

> *If I could save time in a bottle*
> *The first thing that I'd like to do*
> *Is to save every day*
> *Til Eternity passes away*
> *Just to spend them with you . . .*
> *But there never seems to be enough time*
> *To do the things you want to do*
> *Once you find them*
> *I've looked around enough to know*
> *That you're the one I want to go*
> *Through time with*
> —Jim Croce, "Time in a Bottle"

Jim Croce's song connects time with love and the hope of going through time with someone we love. Love and intimacy are important themes of adult development. So is time. In middle adulthood, individuals increasingly think about time-left-to-live instead of time-since-birth (Setterson, 2009). Middle-aged adults begin to look back to where they have been, reflecting on what they have done with the time they have had. They look toward the future more in terms of how much time remains to accomplish what they hope to do with their lives.

topical **connections**

Emerging adulthood, which occurs at approximately 18 to 25 years of age, is characterized by experimentation and exploration. Peak physical performance often occurs from about 19 to 26 years of age, but toward the latter part of early adulthood, a slowdown in physical performance is often apparent. Emerging adults have sexual intercourse with more individuals than young adults, but have sex less frequently. Thinking becomes more pragmatic and reflective in early adulthood than adolescence. Career development is an important aspect of early adulthood and work becomes a more central aspect of most young adults' lives.

looking ***back***

preview

When young adults look forward in time to what their lives might be like as middle-aged adults, too often they anticipate that things will go downhill. However, like all periods of the human life span, for most individuals there usually are positive and negative features of middle age. In this first chapter on middle adulthood, we will discuss physical changes; cognitive changes; changes in careers, work, and leisure; as well as the importance of religion and meaning in life during middle adulthood. To begin, though, we will explore how middle age is changing.

1 The Nature of Middle Adulthood

LG1 Explain how midlife is changing, and define middle adulthood.

- Changing Midlife
- Defining Middle Adulthood

Is midlife experienced the same way today as it was 100 years ago? To just 25 years ago? How can middle adulthood be defined, and what are some of its main characteristics?

CHANGING MIDLIFE

Many of today's 50-year-olds are in better shape, more alert, and more productive than their 40-year-old counterparts from a generation or two earlier. As more people lead healthier lifestyles and medical discoveries help to stave off the aging process, the boundaries of middle age are being pushed upward. It looks like middle age is starting later and lasting longer for increasing numbers of active, healthy, and productive people. A current saying is "60 is the new 40," implying that many 60-year-olds today are living a life that is as active, productive, and healthy as earlier generations did in their forties.

Questions such as, "To which age group do you belong?" and "How old do you feel?" reflect the concept of *age identity*. A consistent finding is that as adults become older their age identity is younger than their chronological age (Setterson & Trauten, 2009; Westerhof, 2009). One study found that almost half of the individuals 65 to 69 years of age considered themselves middle-aged (National Council on Aging, 2000), and another study found a similar pattern: Half of the 60- to 75-year-olds viewed themselves as being middle-aged (Lachman, Maier, & Budner, 2000). Also, some individuals consider the upper boundary of midlife as the age at which they make the transition from work to retirement.

When Carl Jung studied midlife transitions early in the 20th century, he referred to midlife as the afternoon of life (Jung, 1933). Midlife serves as an important preparation for late adulthood, "the evening of life" (Lachman, 2004, p. 306). But "midlife" came much earlier in Jung's time. In 1900 the average life expectancy was only 47 years of age; only 3 percent of the population lived past 65. Today, the average life expectancy is 78, and 12 percent of the U.S. population is older than 65. As a much greater percentage of the population lives to an older age, the midpoint of life and what constitutes middle age or middle adulthood are getting harder to pin down (Staudinger & Bluck, 2001).

How is midlife changing?

Compared with previous decades and centuries, an increasing percentage of the population is made up of middle-aged and older adults (Uhlenberg & Dannefer, 2007). In the past, the age structure of the population could be represented by a pyramid, with the largest percentage of the population in the childhood years. Today, the percentages of people at different ages in the life span are more similar, creating what is called the "rectangularization" of the age distribution (a vertical rectangle) (Himes, 2009a). The rectangularization has been created by health advances that promote longevity, low fertility rates, and the aging of the baby-boom cohort (Moen, 2007).

DEFINING MIDDLE ADULTHOOD

Though the age boundaries are not set in stone, we will consider **middle adulthood** as the developmental period that begins at approximately 40 to 45 years of age and extends to about 60 to 65 years of age. For many people, middle adulthood is a time of declining physical skills and expanding responsibility; a period in which people become more conscious of the young-old polarity and the shrinking amount of time left in life; a point when individuals seek to transmit something meaningful to the next generation; and a time when people reach and maintain satisfaction in their careers. In sum, middle adulthood involves "balancing work and relationship responsibilities in the midst of the physical and psychological changes associated with aging" (Lachman, 2004, p. 305).

In midlife, as in other age periods, individuals make choices, selecting what to do, how to invest time and resources, and evaluating what aspects of their lives they need to change. In midlife, "a serious accident, loss, or illness" may be a "wake-up call" and produce "a major restructuring of time and a reassessment" of life's priorities (Lachman, 2004, p. 310). And with an absence of seniority protections, many middle-aged adults experience unexpected job loss and/or are strongly encouraged to take early retirement packages (Sweet, Moen, & Meiksins, 2007).

The concept of gains (growth) and losses (decline) is an important one in life-span development. Middle adulthood is the age period in which gains and losses as well as biological and sociocultural factors balance each other (Baltes, Lindenberger, & Staudinger, 2006). Although biological functioning declines in middle adulthood, sociocultural supports such as education, career, and relationships may peak in middle adulthood (Willis & Schaie, 2005). Thus, middle adulthood may be a unique developmental period in which growth and loss balance each other for many individuals.

> Middle age is a mix of new opportunities and expanding resources accompanied by declines in physical abilities.
>
> —Lois Verbrugge
> *University of Michigan*

Remember from our discussion in Chapter 1 that individuals have not only a chronological age, but also biological, psychological, and social ages. Some experts conclude that compared with earlier and later periods, middle age is influenced more by sociocultural factors (Willis & Martin, 2005).

For many increasingly healthy adults, middle age is lasting longer. Indeed, an increasing number of experts on middle adulthood describe the age period of 55 to 65 as *late midlife* (Deeg, 2005). Compared with earlier midlife, late midlife is more likely to be characterized by "the death of a parent, the last child leaving the parental home, becoming a grandparent, the preparation for retirement, and in most cases actual retirement. Many people in this age range experience their first confrontation with health problems." (Deeg, 2005, p. 211). Overall, then, although gains and losses may balance each other in early midlife, losses may begin to dominate gains for many individuals in late midlife (Baltes, Lindenberger, & Staudinger, 2006).

Keep in mind, though, that midlife is characterized by individual variations (Perrig-Chiello & Perren, 2005). As life-span expert Gilbert Brim (1992) commented, middle adulthood is full of changes, twists, and turns; the path is not fixed. People move in and out of states of success and failure.

developmental **connection**

Life-Span Perspective. There are four types of age: chronological, biological, psychological, and social. Chapter 1, p. 18

middle adulthood The developmental period that begins at approximately 40 to 45 years of age and extends to about 60 to 65 years of age.

Review *Connect* Reflect

LG1 Explain how midlife is changing, and define middle adulthood.

Review

- How is middle age today different than in past generations?
- How is middle adulthood defined, and what are some of its characteristics?

Connect

- In this section, you read about the "rectangularization" of age distribution in our current times being influenced by, among other things, increasing longevity. What did you learn about the history of human longevity in Chapter 1?

Reflect *Your Own Personal Journey of Life*

- How do you think you will experience (are experiencing or have experienced) middle age differently from your parents or grandparents?

2 Physical Development

LG2 Discuss physical changes in middle adulthood.

Physical Changes

Health and Disease

Mortality Rates

Sexuality

What physical changes characterize middle adulthood? How healthy are middle-aged adults? What are the main causes of death in middle age? How sexually active are individuals in middle adulthood?

PHYSICAL CHANGES

Unlike the rather dramatic physical changes that occur in early adolescence and the sometimes abrupt decline in old age, midlife physical changes are usually more gradual. Although everyone experiences some physical change due to aging in the middle adulthood years, the rates of this aging vary considerably from one individual to another. Genetic makeup and lifestyle factors play important roles in whether chronic disease will appear and when. Middle age is a window through which we can glimpse later life while there is still time to engage in prevention and to influence some of the course of aging (Lachman, 2004). Let's now explore some of the physical changes of middle age.

Visible Signs One of the most visible signs of physical changes in middle adulthood is physical appearance. The first outwardly noticeable signs of aging usually are apparent by the forties or fifties. The skin begins to wrinkle and sag because of a loss of fat and collagen in underlying tissues (Farage & others, 2009). Small, localized areas of pigmentation in the skin produce aging spots, especially in areas that are exposed to sunlight, such as the hands and face. Hair becomes thinner and grayer due to a lower replacement rate and a decline in melanin production. Fingernails and toenails develop ridges and become thicker and more brittle.

Since a youthful appearance is stressed in many cultures, individuals whose hair is graying, whose skin is wrinkling, whose body is sagging, and whose teeth are yellowing strive to make themselves look younger. Undergoing cosmetic surgery, dyeing hair, purchasing wigs, enrolling in weight reduction programs, participating in exercise regimens, and taking heavy doses of vitamins are common in middle age. Baby boomers have shown a strong interest in plastic surgery and Botox, which may reflect their desire to take control of the aging process (Ascher & others, 2010; Niamtu, 2009; Wu, 2010).

Height and Weight Individuals lose height in middle age, and many gain weight. On average, from 30 to 50 years of age, men lose about inch in height, then may lose another inch from 50 to 70 years of age (Hoyer & Roodin, 2009). The height loss for women can be as much as 2 inches from 25 to 75 years of age. Note that there are large variations in the extent to which individuals become shorter with aging. The decrease in height is due to bone loss in the vertebrae. On average, body fat accounts for about 10 percent of body weight in adolescence; it makes up 20 percent or more in middle age.

In a national survey, 29 percent of U.S. adults 40 to 59 years of age were classified as obese (Centers for Disease Control and Prevention, 2006). In Chapter 13, we saw that 33 percent of U.S. adults age 20 and over were classified as obese. Being overweight is a critical health problem in middle adulthood (Himes, 2009b; Wyn & Peckham, 2010). For example, obesity increases the probability that an individual will suffer a number of other ailments, among them hypertension (abnormally high blood pressure), diabetes, and digestive disorders (Bazzano & others, 2010; Bloomgarden, 2010). A large-scale study found that being overweight or obese in middle age increases an individual's risk of dying earlier (Adams & others, 2006). More than 500,000 50- to 71-year-olds completed surveys about their height and weight, and the researchers examined the participants' death records across a 10-year period. Those who were overweight (defined as a body mass index, which takes into account height and weight, of 25 or more) at 50 had a 20 to 40 percent higher risk of earlier death, whereas those who were obese (a body mass index of 30 or more) had a 100 to 200 percent higher risk of premature death.

Although we have highlighted the health risks of being overweight or obese in middle adulthood, severe weight loss also can pose a risk in the case of acute diseases.

Strength, Joints, and Bones As we saw in Chapter 13, maximum physical strength often is attained in the twenties. The term *sarcopenia* is given to age-related loss of muscle mass and strength (Doran & others, 2009; Narici & Maffulli, 2010). The rate of muscle loss with age occurs at a rate of approximately 1 to 2 percent per year past the age of 50 (Marcell, 2003). A loss of strength especially occurs in the back and legs. Exercise can reduce the decline involved in sarcopenia (Park & others, 2010).

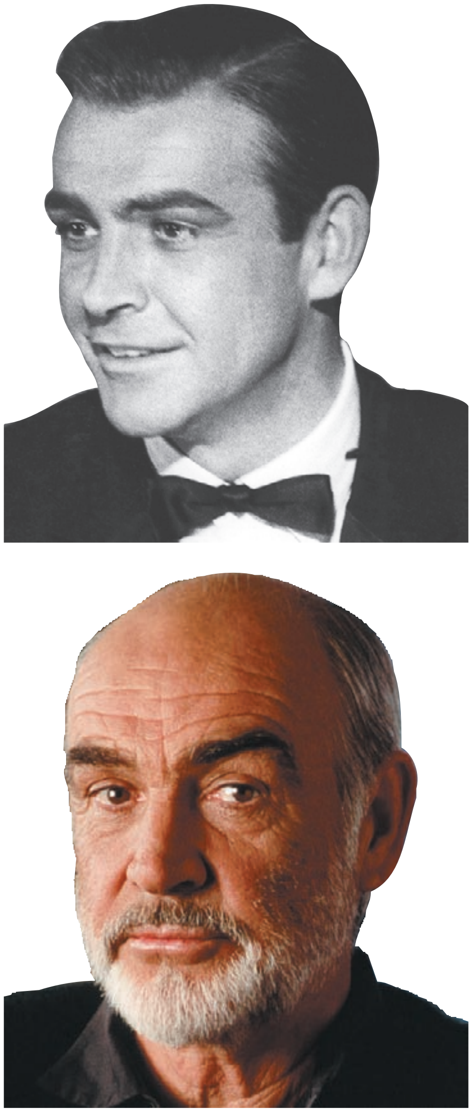
Peak functioning of the body's joints also usually occurs in the twenties. The cushions for the movement of bones (such as tendons and ligaments) become less efficient in the middle-adult years, a time when many individuals experience joint stiffness and more difficulty in movement.

Maximum bone density occurs by the mid- to late thirties, from which point there is a progressive loss of bone. The rate of this bone loss begins slowly but accelerates in the fifties (Ryan & Elahi, 2007). Women experience about twice the rate of bone loss as men. By the end of midlife, bones break more easily and heal more slowly (Neer & SWAN Investigators, 2010; Ritchie, 2010).

Vision and Hearing *Accommodation* of the eye—the ability to focus and maintain an image on the retina—experiences its sharpest decline between 40 and 59 years of age. In particular, middle-aged individuals begin to have difficulty viewing close objects.

The eye's blood supply also diminishes, although usually not until the fifties or sixties. The reduced blood supply may decrease the visual field's size and account for an increase in the eye's blind spot. At 60 years of age, the retina receives only one-third as much light as it did at 20 years of age, much of which is due to a decrease in the size of the pupil (Scialfa & Kline, 2007).

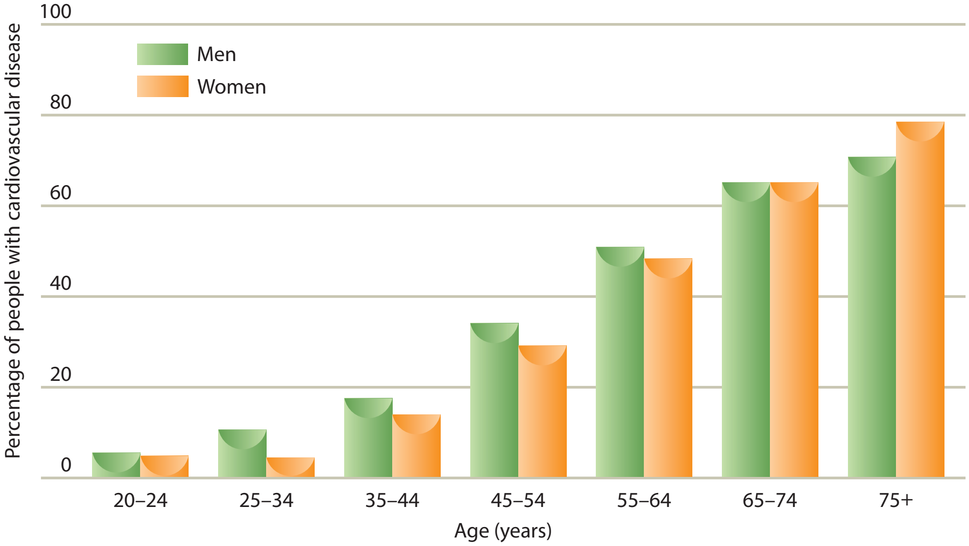
Hearing also can start to decline by the age of 40. Auditory assessments indicate that hearing loss occurs in as many as 50 percent of individuals 50 years and older (Fowler & Leigh-Paffenroth, 2007). Sensitivity to high pitches usually declines first. The ability to hear low-pitched sounds does not seem to decline much in middle adulthood, though. Men usually lose their sensitivity to high-pitched sounds sooner than women do. However, this gender difference might be due to men's greater exposure to noise in occupations such as mining, automobile work, and so on.



Famous actor Sean Connery as a young adult in his twenties (*top*) and as a middle-aged adult in his fifties (*bottom*). *What are some of the most outwardly noticeable signs of aging in the middle adulthood years?*

FIGURE **15.1**

THE RELATION OF AGE AND GENDER TO CARDIOVASCULAR DISEASE. Notice the sharp increase in cardiovascular disease in middle age.



Researchers are identifying new possibilities for improving the vision and hearing of people as they age. One way this is being carried out is through better control of glare or background noise (Natalizia & others, 2010). Further, recent advances in hearing aids dramatically improve hearing for many individuals (Lewis, Goodman, & Bentler, 2010).

Cardiovascular System Midlife is the time when high blood pressure and high cholesterol often take adults by surprise (Lachman, 2004). As indicated in Figure 15.1, cardiovascular disease increases considerably in middle age.

The level of cholesterol in the blood increases through the adult years and in midlife begins to accumulate on the artery walls, increasing the risk of cardiovascular disease (Betensky, Contrada, & Leventhal, 2009; Yetukuri & others, 2010). The type of cholesterol in the blood, however, influences its effect (Khera & Rader, 2010; Whayne, 2009). Cholesterol comes in two forms: LDL (low-density lipoprotein) and HDL (high-density lipoprotein). LDL is often referred to as "bad" cholesterol because when the level of LDL is too high, it sticks to the lining of blood vessels, which can lead to atherosclerosis (hardening of the arteries). HDL is often referred to as "good" cholesterol because when it is high and LDL is low, the risk of cardiovascular disease is lessened (Gao & others, 2009; Weissglas-Volkov & Pajukanta, 2010).

Blood pressure (hypertension), too, usually rises in the forties and fifties. At menopause, a woman's blood pressure rises sharply and usually remains above that of a man through life's later years (Taler, 2009).

An increasing problem in middle and late adulthood is *metabolic syndrome*, a condition characterized by hypertension, obesity, and insulin resistance. Metabolic syndrome often leads to the development of diabetes and cardiovascular disease (Cheung, 2010). A recent meta-analysis revealed that metabolic syndrome was an important risk factor for any cause of death (Hui, Liu, & Ho, 2010).

Exercise, weight control, and a diet rich in fruits, vegetables, and whole grains can often help to stave off many cardiovascular problems in middle age (Nagashima & others, 2010; Natali & others, 2009; O'Donovan & others, 2010). For example, cholesterol levels are influenced by heredity, but LDL can be reduced and HDL increased by eating food that is low in saturated fat and cholesterol and by exercising regularly (Kawano & others, 2009). A recent study of postmenopausal women revealed that 12 weeks of aerobic exercise training improved their cardiovascular functioning (O'Donnell, Kirwan, & Goodman, 2009).

developmental **connection**

Conditions, Diseases, and Disorders. Obesity in childhood is linked to the development of metabolic syndrome in adulthood. Chapter 9, p. 281

Members of the Masai tribe in Kenya, Africa, can stay on a treadmill for a long time because of their active lives. Incidence of heart disease is extremely low in the Masai tribe, which also can be attributed to their energetic lifestyle.

connecting through research

How Does Fitness in Young Adults Correlate with Cardiovascular Health in Middle Age?

One longitudinal study was the first large-scale observational study to examine the role of fitness on healthy young adults' development of risk factors for heart disease (Carnethon & others, 2003). Previous studies had focused on the relation between fitness and death from heart disease and stroke.

The study involved 4,487 men and women in four cities (Birmingham, Alabama; Chicago, Illinois; Minneapolis, Minnesota; and Oakland, California). Initial assessments were made when the participants were 18 to 30 years of age with follow-up assessments conducted 2, 5, 7, 10, and 15 years later. Cardiorespiratory fitness was measured with an exercise treadmill test, which consisted of up to nine two-minute stages of progressive difficulty.

Poor cardiorespiratory fitness in young men and women, determined by the duration of their treadmill exercise test, was associated with the risk of developing hypertension, diabetes, and metabolic syndrome in middle age. Improved fitness over seven years was related to a reduced risk of developing diabetes and metabolic syndrome.

This research reinforces the importance of establishing good health habits early in life. Staying fit when you are younger not only improves your health at that point in your life but it also increases the likelihood that you will remain healthy when you get older.

How might physical fitness in early adulthood be linked to health in middle adulthood?

The good news is that deaths due to cardiovascular disease have been decreasing in the United States since the 1970s. Why the decrease? Advances in drug medication to lower blood pressure and cholesterol, diet, and exercise in high-risk individuals have led to the reduction in deaths due to cardiovascular disease (Coccheri, 2010; Lewis, 2009).

Does your fitness level in your young adult years have much impact on your risk of cardiovascular disease in middle age? To find out, see *Connecting Through Research*.

Lungs There is little change in lung capacity through most of middle adulthood. However, at about the age of 55, the proteins in lung tissue become less elastic. This change, combined with a gradual stiffening of the chest wall, decreases the lungs' capacity to shuttle oxygen from the air people breathe to the blood in their veins. As shown in Figure 15.2, the lung capacity of individuals who are smokers drops precipitously in middle age, but if the individuals quit smoking, their lung capacity improves, although not to the level of individuals who have never smoked.

Sleep Some aspects of sleep become more problematic in middle age (McCrae & Dubyak, 2009). The total number of hours slept usually remains the same as in early adulthood, but beginning in the forties, wakeful periods are more frequent and there is less of the deepest type of sleep (stage 4). The amount of time spent lying awake in bed at night begins to increase in middle age, and this can produce a feeling of being less rested in the morning. Sleep problems in middle-aged adults are more common in individuals who use a higher number of prescription and nonprescription drugs, are obese, have cardiovascular disease, or are depressed (Kaleth & others, 2007; Loponen & others, 2010).

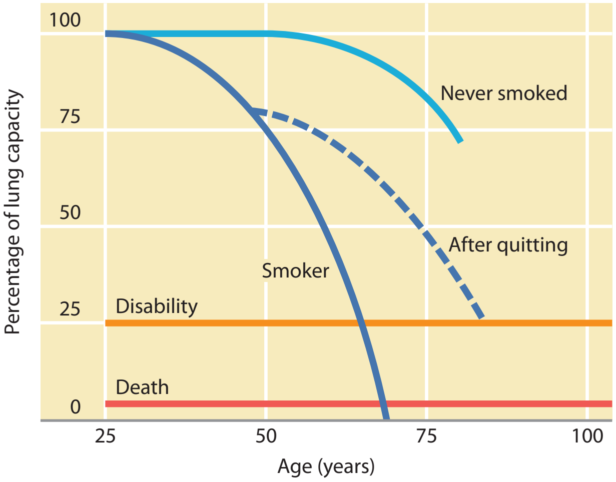


FIGURE **15.2**

THE RELATION OF LUNG CAPACITY TO AGE AND CIGARETTE SMOKING. Lung capacity shows little change through middle age for individuals who have not smoked. However, smoking is linked with reduced lung capacity in middle-aged and older adults. When individuals stop smoking, their lung capacity becomes greater than those who continue to smoke, but not as great as the lung capacity of individuals who have never smoked.

HEALTH AND DISEASE

In middle adulthood, the frequency of accidents declines and individuals are less susceptible to colds and allergies than in childhood, adolescence, or early adulthood. Indeed, many individuals live through middle adulthood without having a disease or persistent health problem. However, disease and persistent health problems become more common in middle adulthood for other individuals.

Chronic disorders are characterized by a slow onset and a long duration. Chronic disorders are rare in early adulthood, increase in middle adulthood, and become common in late adulthood. Overall, arthritis is the leading chronic disorder in middle age, followed by hypertension, but the frequency of chronic disorders in middle age varies by gender. Men have a higher incidence of fatal chronic conditions (such as coronary heart disease, cancer, and stroke); women have a higher incidence of nonfatal ones (such as arthritis, varicose veins, and bursitis).

Stress and Disease Stress is increasingly being found to be a factor in disease (Kahana, Kahana, & Hammel, 2009). The cumulative effect of stress often takes a toll on the health of individuals by the time they reach middle age. Stress is linked to disease through both the immune system and cardiovascular disease (Bauer, Jeckel, & Luz, 2009; Ho & others, 2010).

developmental **connection**

Stress. Recently, a variation of hormonal stress theory has emphasized a decline in immune system functioning as an important contributor to lower resistance to stress in older adults. Chapter 17, p. 538

The Immune System and Stress The immune system keeps us healthy by recognizing foreign materials such as bacteria, viruses, and tumors and then destroying them. Immune system functioning decreases with normal aging (Lustgarten, 2009).

The immune system's machinery consists of billions of white blood cells located in the circulatory system. The number of white blood cells and their effectiveness in killing foreign viruses or bacteria are related to stress levels. When a person is under stress, viruses and bacteria are more likely to multiply and cause disease. One study in young and middle-aged adults revealed that persistently unemployed individuals had lower natural killer (NK) cell levels than their previously unemployed counterparts who became reemployed (Cohen & others, 2007). NK cells are a type of white blood cell that is more likely to be present in low-stress circumstances (see Figure 15.3). Lower levels of NK cells in stressful situations indicate a weakened immune system.

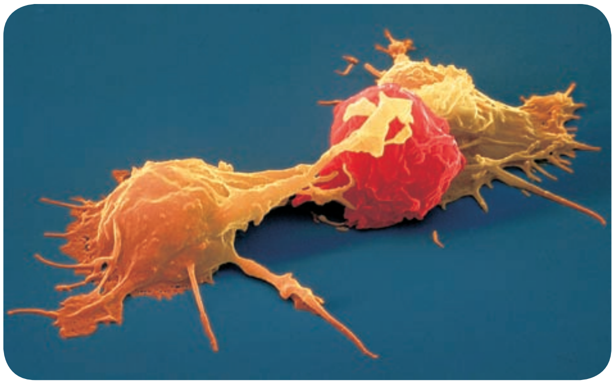


FIGURE **15.3**

NK CELLS AND CANCER. Two natural killer (NK) cells (*yellow*) are shown attacking a leukemia cell (*red*). Notice the blisters that the leukemia cell has developed to defend itself. Nonetheless, the NK cells are surrounding the leukemia cell and are about to destroy it.

Stress and the Cardiovascular System Stress and negative emotions can affect the development and course of cardiovascular disease by altering underlying physiological processes (Phillips & Hughes, 2010; Serido & Totenhagen, 2009). Sometimes, though, the link between stress and cardiovascular disease is indirect. For example, people who live in a chronically stressed condition are more likely to take up smoking, start overeating, and avoid exercising. All of these stress-related behaviors are linked with the development of cardiovascular disease (Betensky, Contrada, & Leventhal, 2009; Tomiyama & others, 2010).

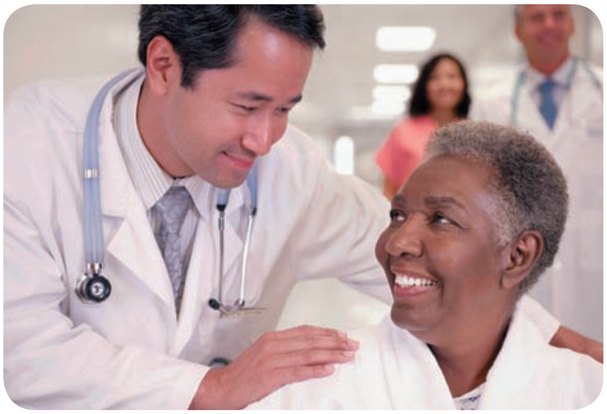
Culture and Health Culture plays an important role in coronary disease. Cross-cultural psychologists maintain that studies of immigrants shed light on the role culture plays in health (Freeman & others, 2010). When people migrate to another culture, their health practices are likely to change while their genetic predispositions to certain disorders remain constant.

There also are differences within ethnic groups as well as among them. This is just as true of health within ethnic groups as it is of, say, family structure. Asian Americans, for example, are strikingly varied in their national backgrounds, lifestyles,

chronic disorders Disorders that are characterized by slow onset and long duration. They are rare in early adulthood, they increase during middle adulthood, and they become common in late adulthood.

and health. They range from highly acculturated Japanese Americans, who may be well educated and have excellent access to health care, to the many Southeast Asian refugees who have few economic resources and may be in poor health. The living conditions and lifestyles of individuals within an ethnic group are influenced by their socioeconomic status, immigrant status, social and language skills, occupational opportunities, and such social resources as the availability of meaningful support networks—all of which play a role in health.

Despite these variations within ethnic groups, it is useful to know about differences among ethnic groups (Caughey & others, 2010; Kirby, 2009). Older African Americans, for example, have an above-average rate of high blood pressure and stroke (Feng, Hendry, & Adams, 2010). Diabetes occurs at an above-average rate among Latinos (Brown, 2009). Also, Latinas are less likely than non-Latina Whites to obtain Pap test screening and have higher rates of cervical cancer (Byrd, Chavez, & Wilson, 2007).



What are some ethnic variations in health?

Prejudice and racial segregation are the historical underpinnings for the chronic stress of discrimination and poverty that adversely affects the health of many African Americans (Peek & others, 2010; Sorkin, Ngo-Metzger, & De Alba, 2010). Support systems, such as an extended family network, may be especially important resources to improve the health of African Americans and help them cope with stress.

Prejudice and discrimination may also be significant stressors affecting the heath of immigrants from Puerto Rico, Mexico, and elsewhere in Latin America. Immigrants may also face cultural barriers to adequate health care, including a lack of financial resources and poor language skills, which often prevent effective doctor-patient communications. In addition, immigrants often are unfamiliar with how the medical system operates, confused about the need to see numerous people, and uncertain about why they have to wait so long for service.

Health care professionals can increase their effectiveness with ethnic minority patients by improving their knowledge of patients' attitudes, beliefs, and folk practices regarding health and disease. Such information should be integrated into Western treatment rather than ignored at the risk of alienating patients.

MORTALITY RATES

Infectious disease was the main cause of death until the middle of the 20th century. As infectious disease rates declined, and more individuals lived through middle age, chronic disorders increased (Kelley-Moore, 2009). Chronic diseases are now the main causes of death for individuals in middle adulthood.

In middle age, many deaths are caused by a single, readily identifiable condition, whereas in old age, death is more likely to result from the combined effects of several chronic conditions (Gessert, Elliott, & Haller, 2003). For many years heart disease was the leading cause of death in middle adulthood, followed by cancer; however, in 2005 more individuals 45 to 64 years of age in the United States died of cancer, followed by cardiovascular disease (National Center for Health Statistics, 2008). The gap between cancer as the leading cause of death widens as individuals age from 45 to 54 and 55 to 64 years of age (National Center for Health Statistics, 2008). Men have higher mortality rates than women for all of the leading causes of death.

SEXUALITY

What kinds of changes characterize the sexuality of women and men as they go through middle age? **Climacteric** is a term that is used to describe the midlife transition in which fertility declines. Let's explore the substantial differences in the climacteric of women and men.

Menopause Most of us know something about menopause. But is what we know accurate? What is menopause, when does it occur, and what are its side effects?

climacteric The midlife transition in which fertility declines.

Researchers have found that almost 50 percent of Canadian and American women have occasional hot flashes, but only one in seven Japanese women do (Lock, 1998). *What factors might account for these variations?*

Menopause is the time in middle age, usually in the late forties or early fifties, when a woman's menstrual periods completely cease. The average age at which women have their last period is 51 (Wise, 2006). However, there is large variation in the age at which menopause occurs—from 39 to 59 years of age. Virtually all women are postmenopausal by 60 years of age (Gosden, 2007). Later menopause is linked with increased risk for breast cancer (Mishra & others, 2009).

Recall from Chapter 11, "Physical and Cognitive Development in Adolescence," that the timing of *menarche*, a girl's first menstruation, has significantly decreased since the mid-19th century, occurring as much as four years earlier in some countries (Susman & Dorn, 2009). Has there been a similar earlier onset in the occurrence of menopause? No, there hasn't been a similar earlier corresponding change in menopause, and there is little or no correlation between the onset of menarche and the onset of menopause (Gosden, 2007).

Perimenopause is the transitional period from normal menstrual periods to no menstrual periods at all, which often takes up to 10 years (De Franciscis & others, 2007; Seritan & others, 2010). Perimenopause is most common in the forties but can occur in the thirties.

Heredity and experience influence the onset of menopause and its symptoms (Gosden, 2007; Liu & others, 2010). Menopause occurs one to two years earlier in women who smoke cigarettes on a regular basis because tobacco smoke and tar can damage ovaries (Gosden, 2007). One study revealed that menopausal symptoms increased in women who smoked cigarettes, drank alcohol, were currently using oral contraceptives, were depressed, and ate high-sugar-content foods (Sabia & others, 2008). And an eight-year longitudinal study of women in their forties and fifties found that walking regularly 1½ hours a day five days a week was linked to fewer symptoms of anxiety and depression as women made the transition from having regular menstrual periods to menopause (Nelson & others, 2008).

Not only the timing but also the side effects of menopause vary greatly. In menopause, production of estrogen by the ovaries declines dramatically, and this decline produces uncomfortable symptoms in some women—"hot flashes," nausea, fatigue, and rapid heartbeat, for example (Cooper & others, 2008). Cross-cultural studies reveal wide variations in the menopause experience (Freeman & Sherif, 2007; Lerner-Geva & others, 2010). For example, hot flashes are uncommon in Mayan women. Asian women report fewer hot flashes than women in Western societies. It is difficult to determine the extent to which these cross-cultural variations are due to genetic, dietary, reproductive, or cultural factors.

Menopause overall is not the negative experience for most women that it was once thought to be (Bauld & Brown, 2009; Weismiller, 2009). However, the loss of fertility is an important marker for women—it means that they have to make final decisions about having children. By their mid-thirties, women who have never had children sometimes speak about being "up against the biological clock" because they cannot postpone choices about having children much longer.

Until recently, hormone replacement therapy was often prescribed as treatment for unpleasant side effects of menopause. *Hormone replacement therapy (HRT)* augments the declining levels of reproductive hormone production by the ovaries (Nappi & Polatti, 2009; Studd, 2010). HRT can consist of various forms of estrogen, and usually a progestin. A study of HRT's effects was halted as evidence emerged that participants who were receiving HRT faced an increased risk of stroke (National Institutes of Health, 2004). Recent analyses confirmed that combined estrogen and progestin hormone therapy poses an increased risk of cardiovascular disease (Toh & others, 2010). Estrogen alone increased the risk of stroke by about the same amount as estrogen combined with progestin. Preliminary data also indicated a trend toward increased risk of dementia (deterioration of mental functioning) among those receiving HRT. On the positive side, the study found that estrogen lowered the risk of hip

menopause Cessation of a woman's menstrual periods, usually in the late forties or fifties.

fractures and did not increase the risk of heart attacks or breast cancer. However, recent research studies in a number of countries have found that coinciding with the decreased use of HRT in recent years has been a related decline in the incidence of breast cancer (Dobson, 2009; Vankrunkelsven & others, 2009).

The National Institutes of Health recommend that women with a uterus who are currently taking hormones should consult with their doctor to determine whether they should continue the treatment. If they are taking HRT for short-term relief of symptoms, the benefits may outweigh the risks (Schindler, 2006). However, the recent evidence of risks associated with HRT suggests that long-term hormone therapy should be seriously reevaluated (Warren, 2007). Because of the potential negative effects of HRT, many middle-aged women are seeking alternatives such as regular exercise, dietary supplements, herbal remedies, relaxation therapy, acupuncture, and nonsteroidal medications (Cardini & others, 2010; Gosden, 2007).

One potential benefit of HRT that has been proposed is that it may help to protect against cognitive aging in women. However, recent research reviews concluded that HRT is not effective in maintaining or improving cognitive functioning in postmenopausal women (Hogervorst & others, 2009; Lethaby & others, 2008).

Hormonal Changes in Middle-Aged Men Do men go through anything like the menopause that women experience? That is, is there a male menopause? During middle adulthood, most men do not lose their capacity to father children, although there usually is a modest decline in their sexual hormone level and activity (Kohler & others, 2008). Men experience hormonal changes in their fifties and sixties, but nothing like the dramatic drop in estrogen that women experience. Testosterone production begins to decline about 1 percent a year during middle adulthood, and sperm count usually shows a slow decline, although men do not lose their fertility in middle age (Harman, 2007). The gradual decline in men's testosterone levels in middle age can reduce their sexual drive (Goel & others, 2009). A recent study of Taiwanese men revealed a testosterone deficiency that increased with age and this deficiency was higher in men who were obese and/or diabetic (Liu & others, 2009).

A common development in middle-aged men is **erectile dysfunction,** the inability to adequately achieve and maintain an erection that results in satisfactory sexual performance (De Berardis & others, 2009). In a recent national study of U.S. men 40 years and older, 22 percent said they "sometimes" or "never" get or keep an erection adequate for sexual intercourse (Laumann & others, 2007). The percentage of men with erectile dysfunction increased the older they were and decreased if they engaged in regular exercise. Researchers have found that two-thirds of men report that erectile dysfunction has impaired their self-esteem and one-third claim that it has harmed their relationship with their partner (Mirone & others, 2009).

NDC 0069-4210-30
30 Tablets
Rx only
Viagra®
50
(sildenafil citrate) tablets
50 mg*
Distributed by
Pfizer
Pfizer Labs
Division of Pfizer Inc, NY, NY 10017

Middle-aged men's erections are less full and less frequent, and require more stimulation to achieve them. Researchers once attributed these changes to psychological factors, but increasingly they find that as many as 75 percent of the erectile dysfunctions in middle-aged men stem from physiological problems. Smoking, diabetes, hypertension, and elevated cholesterol levels are at fault in many erectile problems in middle-aged men (Laumann & others, 2007).

Treatment for men with erectile dysfunction has focused recently on the drug Viagra and on

erectile dysfunction The inability to adequately achieve and maintain an erection that results in satisfactory sexual performance.

similar drugs that appeared after Viagra became popular, such as Levitra and Cialis (Althof & others, 2010; Sperling & others, 2010). Viagra works by allowing increased blood flow into the penis, which produces an erection (Claes, 2010). Its success rate is in the range of 60 to 85 percent (Pavone & others, 2008). Studies continue to show that a high percentage of men who take Viagra for erectile dysfunction are highly satisfied with the effectiveness of the drug (Abdo & others, 2008). A recent study revealed that Viagra also improved the self-esteem, confidence, and relationships of men with erectile dysfunction (Glina & others, 2009). Researchers also have found that Levitra and Cialis are as successful as Viagra in treating erectile dysfunction and have similar side effects (Althof & others, 2010; Park & others, 2010).

Lifestyle also plays a role in erectile dysfunction. Obesity, a sedentary lifestyle, and smoking significantly increase the risk of erectile dysfunction (Heidelbaugh, 2010). A recent study revealed that low testosterone levels were related to the presence of metabolic syndrome and a high level of triglycerides (Corona & others, 2009). In another recent study, middle-aged men were randomly assigned to one of two treatment groups: (1) An experimental group that was given detailed, individualized information about the importance of reducing body weight, improved quality of diet, and increased physical activity in reducing erectile dysfunction, and (2) a control group that was provided general information about healthy food choices and increasing physical activity (Esposito & others, 2009). After two years of intervention, the men in the experimental group were more successful in improving their lifestyles and had a greater reduction in erectile dysfunction.

Sexual Attitudes and Behavior Although the ability of men and women to function sexually shows little biological decline in middle adulthood, sexual activity usually occurs on a less frequent basis than in early adulthood (Waite, Das, & Laumann, 2009). Figure 15.4 shows the age trends in frequency of sex from the Sex in America survey (described in Chapter 13). The frequency of having sex was greatest for individuals aged 25 to 29 years old (47 percent had sex twice a week or more) and dropped off for individuals in their fifties (23 percent of 50- to 59-year-old males said they had sex twice a week or more; only 14 percent of the females in this age group reported this frequency) (Michael & others, 1994). Note, though, that the Sex in America survey may underestimate the frequency of sexual activity of middle-aged adults because the data were collected prior to the widespread use of erectile dysfunction drugs such as Viagra. Other research indicates that middle-aged men want sex, think about it more, and masturbate more often than middle-aged women (Stones & Stones, 2007). For many other forms of sexual behavior, such as kissing and hugging, sexual touching, and oral sex, male and female

FIGURE **15.4**

THE SEX IN AMERICA SURVEY: FREQUENCY OF SEX AT DIFFERENT POINTS IN ADULT DEVELOPMENT. *Why do you think the frequency of sex declines as men and women get older?*

	Percentage Engaging in Sex				
Age Groups	**Not at all**	**A few times per year**	**A few times per month**	**2–3 times a week**	**4 or more times a week**
Men					
18–24	15	21	24	28	12
25–29	7	15	31	36	11
30–39	8	15	37	23	6
40–49	9	18	40	27	6
50–59	11	22	43	20	3
Women					
18–24	11	16	2	9	12
25–29	5	10	38	37	10
30–39	9	16	6	33	6
40–49	15	16	44	20	5
50–59	30	22	35	12	2

middle-aged adults report similar frequency of engagement (Stones & Stones, 2007). A recent large-scale longitudinal study of women revealed that masturbation increased in early perimenopause but declined during postmenopause (Avis & others, 2009). Also in this study, women's sexual desire decreased by late perimenopause. However, the menopausal transition was not linked to the importance of sex, sexual arousal, frequency of sexual intercourse, emotional satisfaction with a partner, or physical pleasure.

Although middle-aged adults have sex less frequently than when they were younger adults, are they less satisfied with their sex life too? A recent Canadian study of 40- to 64-year olds revealed that only 30 percent reported that their sexual life was less satisfying than when they were in their 20s (Wright, 2006).

Living with a spouse or partner makes all the difference in whether people engage in sexual activity, especially for women over 40 years of age. In one study conducted by the MacArthur Foundation, 95 percent of women in their forties with partners said that they have been sexually active in the last six months, compared with only 53 percent of those without partners (Brim, 1999). By their fifties, 88 percent of women living with a partner have been sexually active in the last six months, but only 37 percent of those who are neither married nor living with someone say they have had sex in the last six months.

A recent large-scale study of U.S. adults 40 to 80 years of age found that early ejaculation (26 percent) and erectile difficulties (22 percent) were the most common sexual problems of older men while lack of sexual interest (33 percent) and lubrication difficulties (21 percent) were the most common sexual problems of older women (Laumann & others, 2009).

How does the pattern of sexual activity change when individuals become middle-aged?

Review *Connect* Reflect

LG2 Discuss physical changes in middle adulthood.

Review

- What are some key physical changes in middle adulthood?
- How would you characterize health and disease in middle adulthood?
- What are the main causes of death in middle age?
- What are the sexual lives of middle-aged adults like?

Connect

- In this section, you read that the production of estrogen by the ovaries declines dramatically in menopause. What did you learn about estrogen's role in puberty in Chapter 11?

Reflect *Your Own Personal Journey of Life*

- If you are a young or middle-aged adult, what can you do at this point in your life to optimize your health in middle age? If you are an older adult, what could you have done better to optimize your health in middle age?

3 Cognitive Development

LG3 Identify cognitive changes in middle adulthood.

Intelligence

Information Processing

We have seen that middle-aged adults may not see as well, run as fast, or be as healthy as they were in their twenties and thirties. But what about their cognitive skills? Do they decline as we enter and move through middle adulthood? To answer this question, we will explore the possibility of cognitive changes in intelligence and information processing.

developmental **connection**

Cognitive Theory. A fifth, postformal stage of cognitive development has been proposed to describe cognitive advances in early adulthood. Chapter 13, p. 433

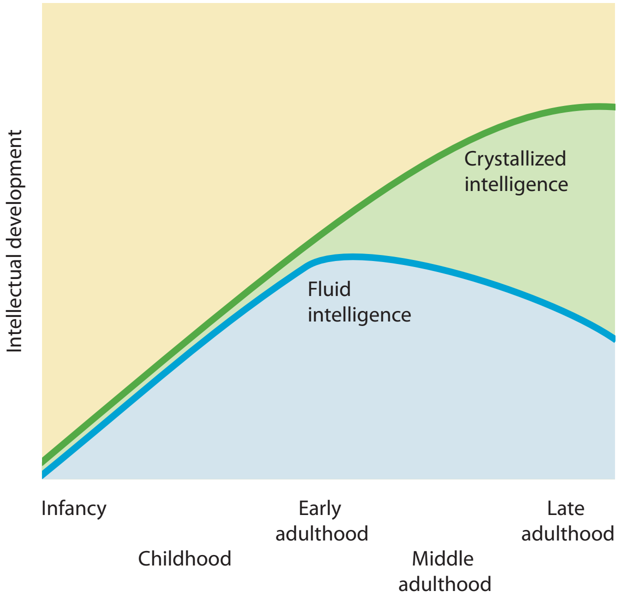


FIGURE **15.5**

FLUID AND CRYSTALLIZED INTELLECTUAL DEVELOPMENT ACROSS THE LIFE SPAN. According to Horn, crystallized intelligence (based on cumulative learning experiences) increases throughout the life span, but fluid intelligence (the ability to perceive and manipulate information) steadily declines from middle adulthood.

INTELLIGENCE

Our exploration of possible changes in intelligence in middle adulthood focuses on the concepts of fluid and crystallized intelligence, the Seattle Longitudinal Study, and cohort effects.

Fluid and Crystallized Intelligence

John Horn argues that some abilities begin to decline in middle age while others increase (Horn & Donaldson, 1980). Horn maintains that **crystallized intelligence,** an individual's accumulated information and verbal skills, continues to increase in middle adulthood, whereas **fluid intelligence,** one's ability to reason abstractly, begins to decline in the middle adulthood years (see Figure 15.5).

Horn's data were collected in a cross-sectional manner. Remember from Chapter 1 that a cross-sectional study assesses individuals of different ages at the same point in time. For example, a cross-sectional study might assess the intelligence of different groups of 40-, 50-, and 60-year-olds in a single evaluation, such as in 1980. The 40-year-olds in the study would have been born in 1940 and the 60-year-olds in 1920—different eras that offered different economic and educational opportunities. The 60-year-olds likely had fewer educational opportunities as they grew up. Thus, if we find differences between 40- and 60-year-olds on intelligence tests when they are assessed cross-sectionally, these differences might be due to cohort effects related to educational differences rather than to age.

By contrast, remember from Chapter 1 that in a longitudinal study, the same individuals are studied over a period of time. Thus, a longitudinal study of intelligence in middle adulthood might consist of giving the same intelligence test to the same individuals when they are 40, 50, and 60 years of age. As we see next, whether data on intelligence are collected cross-sectionally or longitudinally can make a difference in what is found about changes in crystallized and fluid intelligence and about intellectual decline (Abrams, 2009; Schaie, 2009).

The Seattle Longitudinal Study

The Seattle Longitudinal Study that involves extensive evaluation of intellectual abilities in the adulthood years was initiated by K. Warner Schaie (1994, 1996, 2005, 2010, 2011). Participants have been assessed in seven-year intervals since 1956: 1963, 1970, 1977, 1984, 1991, 1998, and 2005. Five hundred individuals initially were tested in 1956. New waves of participants are added periodically. The main focus in the Seattle Longitudinal Study has been on individual change and stability in intelligence, and the study is considered to be one of the most thorough examinations of how people develop and change as they go through the adulthood years.

The main mental abilities tested are:

- Vocabulary (ability to understand ideas expressed in words)
- Verbal memory (ability to encode and recall meaningful language units, such as a list of words)
- Number (ability to perform simple mathematical computations such as addition, subtraction, and multiplication)
- Spatial orientation (ability to visualize and mentally rotate stimuli in two- and three-dimensional space)
- Inductive reasoning (ability to recognize and understand patterns and relationships in a problem and use this understanding to solve other instances of the problem)
- Perceptual speed (ability to quickly and accurately make simple discriminations in visual stimuli)

crystallized intelligence Accumulated information and verbal skills, which increase in middle adulthood, according to Horn.

fluid intelligence The ability to reason abstractly, which begins to decline from middle adulthood on, according to Horn.

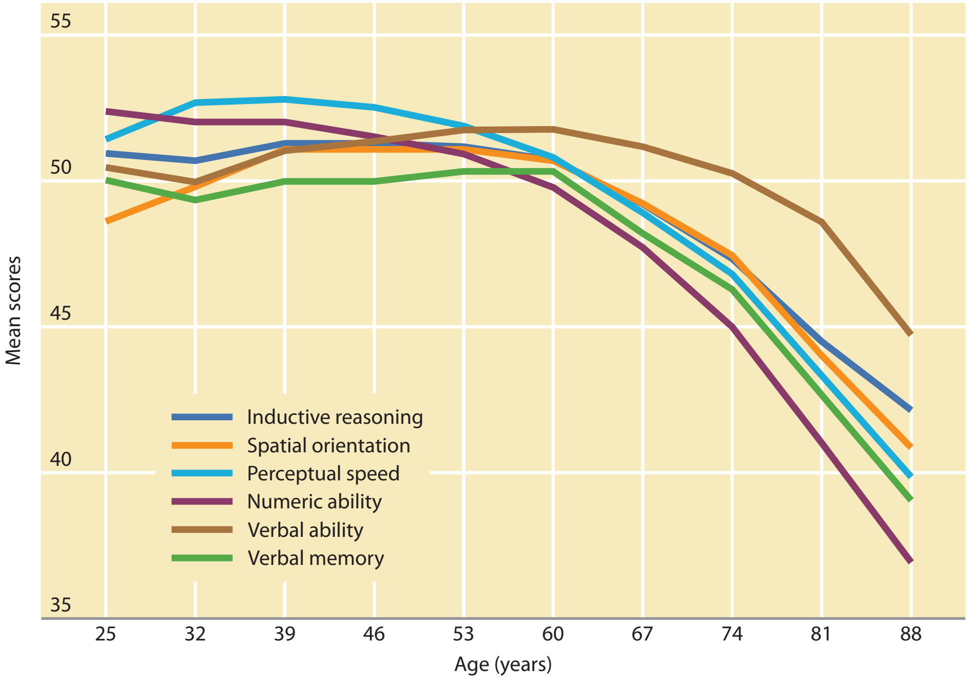


FIGURE **15.6**

LONGITUDINAL CHANGES IN SIX INTELLECTUAL ABILITIES FROM AGE 25 TO AGE 88

As shown in Figure 15.6, the highest level of functioning for four of the six intellectual abilities occurred in the middle adulthood years (Willis & Schaie, 1999). For both women and men, peak performance on verbal ability, verbal memory, inductive reasoning, and spatial orientation was attained in middle age. For only two of the six abilities—number and perceptual speed—were there declines in middle age. Perceptual speed showed the earliest decline, actually beginning in early adulthood. Interestingly, in terms of John Horn's ideas that were discussed earlier, for the participants in the Seattle Longitudinal Study, middle age was a time of peak performance for some aspects of both crystallized intelligence (verbal ability) and fluid intelligence (spatial orientation and inductive reasoning).

Notice in Figure 15.6 that decline in functioning for most cognitive abilities began to steepen in the sixties, although the decline in verbal ability did not steepen until the mid-seventies. From the mid-seventies through the late eighties, all cognitive abilities showed considerable decline.

When Schaie (1994) assessed intellectual abilities both cross-sectionally and longitudinally, he found decline more likely in the cross-sectional than in the longitudinal assessments. For example, as shown in Figure 15.7, when assessed cross-sectionally, inductive reasoning showed a consistent decline in the middle adulthood years. In contrast, when assessed longitudinally, inductive reasoning increased until toward the end of middle adulthood, when it began to show a slight decline. In Schaie's (2008, 2009, 2010, 2011) view, it is in middle adulthood, not early adulthood, that people reach a peak in their cognitive functioning for many intellectual skills.

In further analysis, Schaie (2007) recently examined generational differences in parents and their children over a seven-year time frame from 60 to 67 years of age. That is, parents were assessed when they were 60 to 67 years of age; then when their children reached 60 to 67 years of age, they also were assessed. Higher levels of cognitive functioning occurred for the second generation in inductive reasoning, verbal memory, and spatial orientation, whereas the first generation scored higher on numeric ability. Noteworthy was the finding that the parent generation showed cognitive decline from 60 to 67 years of age, but their offspring showed stability or modest increase in cognitive functioning across the same age range.

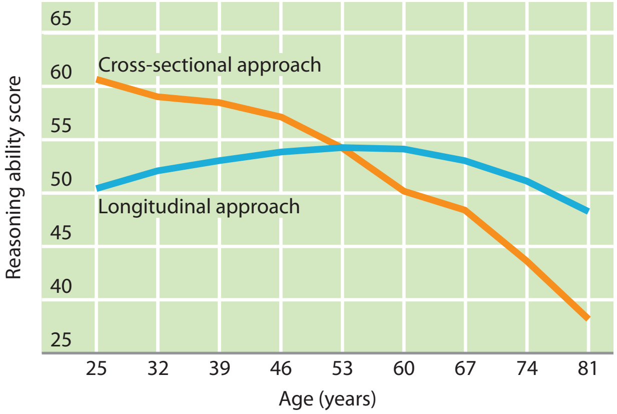


FIGURE **15.7**

CROSS-SECTIONAL AND LONGITUDINAL COMPARISONS OF INTELLECTUAL CHANGE IN MIDDLE ADULTHOOD. *Why do you think reasoning ability peaks during middle adulthood?*

K. Warner Schaie (*right*) is one of the leading pioneers in the field of life-span development. He is shown here with two older adults who are actively using their cognitive skills. Schaie's research represents one of the most thorough examinations of how individuals develop and change as they go through the adult years.

The results from Schaie's study that have been described so far focus on *average* cognitive stability or change for all participants across the middle adulthood years. Schaie and Sherry Willis (Schaie, 2005; Willis & Schaie, 2005) examined individual differences for the participants in the Seattle study and found substantial individual variations. They classified participants as "decliners," "stable," and "gainers" for three categories—number ability, delayed recall (a verbal memory task), and word fluency—from 46 to 60 years of age. The largest percentage of decline (31 percent) or gain (16 percent) occurred for delayed recall; the largest percentage with stable scores (79 percent) occurred for numerical ability. Word fluency declined for 20 percent of the individuals from 46 to 60 years of age.

Might the individual variations in cognitive trajectories in midlife be linked to cognitive impairment in late adulthood? In Willis and Schaie's analysis, cognitively normal and impaired older adults did not differ on measures of vocabulary, spatial orientation, and numerical ability in middle adulthood. However, declines in memory (immediate recall and delayed recall), word fluency, and perceptual speed in middle adulthood were linked to neuropsychologists' ratings of the individuals' cognitive impairment in late adulthood.

Some researchers disagree with Schaie that middle adulthood is the time when the level of functioning in a number of cognitive domains is maintained or even increases (Finch, 2009). For example, Timothy Salthouse (2009) recently concluded that cross-sectional research on aging and cognitive functioning should not be dismissed and that this research indicates reasoning, memory, spatial visualization, and processing speed begin declining in early adulthood and show further decline in the 50s. Salthouse (2009) does agree that cognitive functioning involving accumulated knowledge, such as vocabulary and general information, does not show early age-related decline and increases at least until 60 years of age.

Salthouse (2009) argued that a lower level of cognitive functioning in early and middle adulthood is likely due to age-related neurobiological decline. Cross-sectional studies have shown that these neurobiological factors decline in the 20s and 30s: regional brain volume, cortical thickness, synaptic density, some aspects of myelination, the functioning of some aspects of neurotransmitters such as dopamine and serotonin, blood flow in the cerebral cortex, and the accumulation of tangles in neurons (Del Tredici & Braak, 2008; Erixon-Lindroth & others, 2005; Finch, 2009; Hsu & others, 2008; Pieperhoff & others, 2008; Salat & others, 2004).

Schaie (2009, 2010, 2011) continues to emphasize that longitudinal studies hold the key to determining age-related changes in cognitive functioning and that middle age is the time during which many cognitive skills actually peak. In the next decade, expanding research on age-related neurobiological changes and their possible links to cognitive skills should further refine our knowledge about age-related cognitive functioning in the adult years (Finch, 2009).

INFORMATION PROCESSING

As we saw in our discussion of theories of development (Chapter 1) and of cognitive development from infancy through adolescence (Chapters 5, 7, 9, and 11), the information-processing approach provides another way of examining cognitive abilities. Among the information-processing changes that take place in middle adulthood are those involved in speed of processing information, memory, expertise, and practical problem-solving skills.

Speed of Information Processing As we saw in Schaie's (1994, 1996) Seattle Longitudinal Study, perceptual speed begins declining in early adulthood and continues to decline in middle adulthood. A common way to assess speed of information is through a reaction-time task, in which individuals simply press a button as soon as they see a light appear. Middle-aged adults are slower to push the button when the light appears than young adults are. However, keep in mind that the decline is not dramatic—under 1 second in most investigations.

A current interest focuses on possible causes for the decline in speed of processing information in adults (Salthouse, 2009). The causes may occur at different levels of analysis, such as cognitive ("maintaining goals, switching between tasks, or preserving internal representations despite distraction"), neuroanatomical ("changes in specific brain regions, such as the prefrontal cortex"), and neurochemical ("changes in neurotransmitter systems") such as dopamine (Hartley, 2006, p. 201).

Memory In Schaie's (1994, 1996) Seattle Longitudinal Study, verbal memory peaked in the fifties. However, in some other studies verbal memory has shown a decline in middle age, especially when assessed in cross-sectional studies (Salthouse, 2009). For example, in several studies when asked to remember lists of words, numbers, or meaningful prose, younger adults outperformed middle-aged adults (Salthouse & Skovronek, 1992). Although there still is some controversy about whether memory declines in the middle adulthood years, most experts conclude that it does decline (Hoyer & Roodin, 2009; Salthouse, 2009). However, some experts argue that studies that have concluded there is a decline in memory during middle age often have compared young adults in their twenties with older middle-aged adults in their late fifties and even have included some individuals in their sixties (Schaie, 2000). In this view, memory decline is either nonexistent or minimal in the early part of middle age but does occur in the latter part of middle age or in late adulthood.

Cognitive aging expert Denise Park (2001) argues that starting in late middle age, more time is needed to learn new information. The slowdown in learning new information has been linked to changes in **working memory,** the mental "workbench" where individuals manipulate and assemble information when making decisions, solving problems, and comprehending written and spoken language (Baddeley, 2007). In this view, in late middle age working memory capacity—the amount of information that can be immediately retrieved and used—becomes more limited. Think of this situation as an overcrowded desk with many items in disarray. As a result of the overcrowding and disarray, long-term memory becomes less reliable, more time is needed to enter new information into long-term storage, and more time is required to retrieve the information. Thus, Park concludes that much of the blame for declining memory in late middle age is a result of information overload that builds up as we go through the adult years.

Memory decline is more likely to occur when individuals don't use effective memory strategies, such as organization and imagery (Sugar, 2007). By organizing lists of phone numbers into different categories, or imagining the phone numbers as representing different objects around the house, many individuals can improve their memory in middle adulthood.

Expertise Because it takes so long to attain, expertise often shows up more in the middle adulthood than in the early adulthood years (Kim & Hasher, 2005). Recall from Chapter 9 that *expertise* involves having extensive, highly organized knowledge and understanding of a particular domain. Developing expertise and becoming an "expert" in a field usually is the result of many years of experience, learning, and effort.

Strategies that distinguish experts from novices include these:

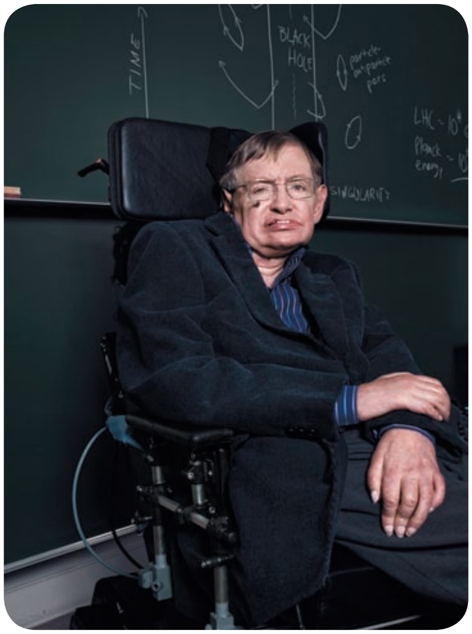
- Experts are more likely to rely on their accumulated experience to solve problems.
- Experts often process information automatically and analyze it more efficiently when solving a problem in their domain than novices do.
- Experts have better strategies and shortcuts to solving problems in their domain than novices do.
- Experts are more creative and flexible in solving problems in their domain than novices are.

developmental **connection**

Memory. Some types of memory decline more than others in older adults. Chapter 18, p. 566

developmental **connection**

Intelligence. One study found that 10- and 11-year-old children who were experienced chess players ("experts") remembered more about chess pieces than college students who were not chess players ("novices"). Chapter 9, p. 290



Stephen J. Hawking is a world-renowned expert in physics. Hawking authored the best-selling book, *A Brief History of Time*. Hawking has a neurological disorder that prevents him from walking or talking. He communicates with the aid of a voice-equipped computer. *What distinguishes experts from novices?*

working memory The mental "workbench," where individuals manipulate and assemble information when decision making, problem solving, and comprehending language.

Practical Problem Solving Everyday problem solving is another important aspect of cognition (Margrett & Deshpande-Kamat, 2009). Nancy Denney (1986, 1990) observed circumstances such as how young and middle-aged adults handled a landlord who would not fix their stove and what they did if a bank failed to deposit a check. She found that the ability to solve such practical problems improved through the forties and fifties as individuals accumulated practical experience. However, since Denney's research other studies on everyday problem-solving and decision-making effectiveness across the adult years have been conducted (Margrett & Deshpande-Kamat, 2009). A meta-analysis of studies indicated that everyday problem-solving and decision-making effectiveness remained stable in early and middle adulthood, then declined in late adulthood (Thornton & Dumke, 2005).

Review *Connect* Reflect

LG3 Identify cognitive changes in middle adulthood.

Review

- How does intelligence develop in middle adulthood?
- What changes take place in processing information during middle age?

Connect

- In this section, you read about longitudinal and cross-sectional studies of intelligence. What were the pros and cons that you learned about these two research approaches in Chapter 1?

Reflect *Your Own Personal Journey of Life*

- Think about your life and the lives of your parents and grandparents. Are there experiences that you are likely to have, are having, or have had that will enhance your intelligence in middle age more than the experiences they had or are having?

4 Careers, Work, and Leisure

LG4 Characterize career development, work, and leisure in middle adulthood.

Work in Midlife

Career Challenges and Changes

Leisure

What are some issues that workers face in midlife? What role does leisure play in the lives of middle-aged adults?

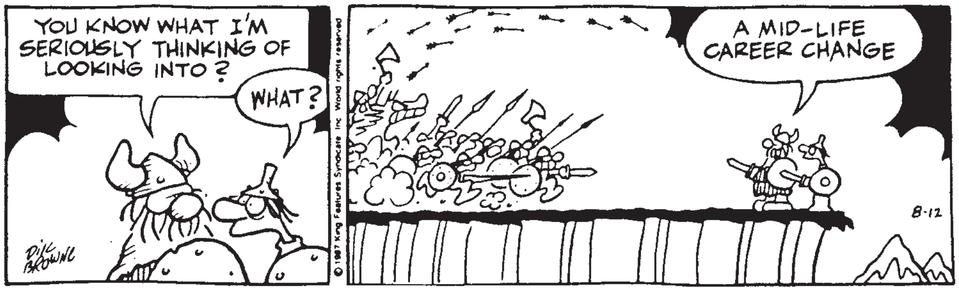
What characterizes work in middle adulthood?

WORK IN MIDLIFE

The role of work, whether one works in a full-time career, a part-time job, as a volunteer, or a homemaker, is central during middle adulthood. Many middle-aged adults reach their peak in position and earnings. However, they may also be saddled with multiple financial burdens from rent or mortgage, child care, medical bills, home repairs, college tuition, loans to family members, or bills from nursing homes.

In the United States, approximately 80 percent of individuals 40 to 59 years of age are employed. In the 51-to-59 age group, slightly less than 25 percent do not work. More than half of this age group say that a health condition or an impairment limits the type of paid work that they do (Sterns & Huyck, 2001).

For many people, midlife is a time of evaluation, assessment, and reflection in terms of the work they do and want to do in the future (Moen, 2009). Among the work issues that some people face in midlife are recognizing limitations in


YOU KNOW WHAT I'M SERIOUSLY THINKING OF LOOKING INTO?
WHAT?
A MID-LIFE CAREER CHANGE
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career progress, deciding whether to change jobs or careers, deciding whether to rebalance family and work, and planning for retirement (Sterns & Huyck, 2001).

Couples increasingly have both spouses in the workforce who are expecting to retire. Historically retirement has been a male transition, but today far more couples have to plan two retirements, his and hers (Moen, 2009; Moen, Kelly, & Magennis, 2008).

developmental **connection**

Work. Work defines people in fundamental ways, influencing their financial standing, housing, the way they spend their time, where they live, their friendships, and their health. Chapter 13, p. 437

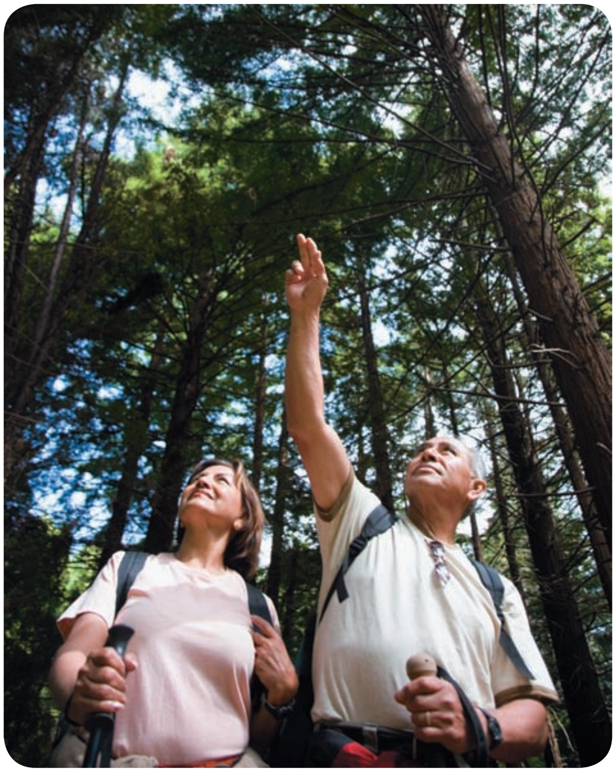
CAREER CHALLENGES AND CHANGES

The current middle-aged worker faces several important challenges in the 21st century (Blossfeld, 2009). These include the globalization of work, rapid developments in information technologies, downsizing of organizations, early retirement, and concerns about pensions and health care.

Globalization has replaced what was once a primarily White male workforce with employees of different ethnic and national backgrounds. To improve profits, many companies are restructuring, downsizing, and outsourcing jobs. One of the outcomes of these changes is to offer incentives to middle-aged employees to retire early—in their fifties, or in some cases even forties, rather than their sixties.

The decline in defined-benefit pensions and increased uncertainty about the fate of health insurance are decreasing the sense of personal control for middle-aged workers. As a consequence, many are delaying retirement plans.

Some midlife career changes are self-motivated; others are the consequence of losing one's job (Moen, 2009). Some individuals in middle age decide that they don't want to do the same work they have been doing for the rest of their lives (Hoyer & Roodin, 2009). One aspect of middle adulthood involves adjusting idealistic hopes to realistic possibilities in light of how much time individuals have before they retire and how fast they are reaching their occupational goals (Levinson, 1978). If individuals perceive that they are behind schedule, if their goals are unrealistic, they don't like the work they are doing, or their job has become too stressful, they could become motivated to change jobs.



Sigmund Freud once commented that the two things adults need to do well to adapt to society's demands are to work and to love. To his list we add "to play." In our fast-paced society, it is all too easy to get caught up in the frenzied, hectic pace of our achievement-oriented work world and ignore leisure and play. *Imagine your life as a middle-aged adult. What would be the ideal mix of work and leisure? What leisure activities do you want to enjoy as a middle-aged adult?*

LEISURE

As adults, not only must we learn how to work well, but we also need to learn how to relax and enjoy leisure (Gibson, 2009). **Leisure** refers to the pleasant times after work when individuals are free to pursue activities and interests of their own choosing—hobbies, sports, or reading, for example. In one analysis of research on what U.S. adults regret the most, not engaging in more leisure was one of the top six regrets (Roese & Summerville, 2005).

Leisure can be an especially important aspect of middle adulthood (Parkes, 2006). By middle adulthood, more money is available to many individuals, and

leisure The pleasant times after work when individuals are free to pursue activities and interests of their own choosing.

there may be more free time and paid vacations. In short, midlife changes may produce expanded opportunities for leisure.

In one study, 12,338 men 35 to 57 years of age were assessed each year for five years regarding whether they took vacations or not (Gump & Matthews, 2000). Then, the researchers examined the medical and death records over nine years for men who lived for at least a year after the last vacation survey. Compared with those who never took vacations, men who went on annual vacations were 21 percent less likely to die over the nine years and 32 percent less likely to die of coronary heart disease.

Adults at midlife need to begin preparing psychologically for retirement. Constructive and fulfilling leisure activities in middle adulthood are an important part of this preparation (Danigelis, 2007). If an adult develops leisure activities that can be continued into retirement, the transition from work to retirement can be less stressful.

Review *Connect* Reflect

LG4 Characterize career development, work, and leisure in middle adulthood.

Review

- What are some issues that workers face in midlife?
- What career challenges and changes might people experience in middle adulthood?
- What characterizes leisure in middle age?

Connect

- In this section, you learned about the leisure time of adults in middle age. What did you learn about cultural differences and leisure time in adolescence in Chapter 12?

Reflect *Your Own Personal Journey of Life*

- What do you want your work life and leisure to be like in middle age? If you are middle-aged, what is your work life and leisure like? If you are an older adult, what were they like in middle age?

5 Religion and Meaning in Life

LG5 Explain the roles of religion and meaning in life during middle adulthood.

Religion and Adult Lives | Religion and Health | Meaning in Life

What roles do religion and spirituality play in the lives of middle-aged adults?

What role does religion play in our development as adults? Is the meaning of life an important theme for many middle-aged adults?

RELIGION AND ADULT LIVES

In the MacArthur Study of Midlife Development, more than 70 percent of U.S. middle-aged adults said they are religious and consider spirituality a major part of their lives (Brim, 1999).

In thinking about religion and adult development, it is important to consider the role of individual differences. Religion is a powerful influence in some adults' lives, whereas it plays little or no role in others' lives (McCullough & others, 2005). Further, the influence of religion in people's lives may change as they develop (George, 2009; Sapp, 2010). In John Clausen's (1993) longitudinal investigation, some individuals who had been strongly religious in their early adult years became less so in middle age; others became more religious in middle age. In a longitudinal study of individuals from their early thirties through their late sixties/early seventies, a significant increase in spirituality occurred between late middle (mid-fifties/early sixties) and late adulthood (Wink & Dillon, 2002) (see Figure 15.8).

meaning-making coping Involves drawing on beliefs, values, and goals to change the meaning of a stressful situation, especially in times of chronic stress as when a loved one dies.

connecting development to life

Religion and Coping

What is the relation between religion and the ability to cope with stress? In a study of 850 medically ill patients admitted to an acute-care hospital, religious coping was related to low depression (Koenig & others, 1992). Religious coping is often beneficial during times of high stress (Koenig, 2001). For example, in one study individuals were divided into those who were experiencing high stress and those with low stress (Manton, 1989). In the high-stress group, spiritual support was significantly related to low depression and high self-esteem. No such links were found in the low-stress group. A recent study revealed that when religion was an important aspect of people's lives, they frequently prayed, and they had positive religious core beliefs, they worried less, were less anxious, and had a lower level of depressive symptoms (Rosmarin, Krumrei, & Andersson, 2009). Another recent study found that coping styles that involved collaboration with others and turning to religious groups were linked to improved psychological adjustment more than a self-directing coping style was (Ross & others, 2009).

A recent interest in linking religion and coping focuses on **meaning-making coping,** which involves drawing on beliefs, values, and goals to change the meaning of a stressful situation, especially in times of chronic stress as when a loved one dies. In Crystal Park's (2005, 2007, 2010a, b) view, religious individuals experience more disruption of their beliefs, values, and goals immediately after the death of a loved one than individuals who are not religious. Eventually, though, individuals who are religious often show better adjustment to the loss. Initially, religion is linked with more depressed feelings about a loved one's death. Over time, however, as religious individuals search for a type of meaning in their loss, the depressed feelings lessen. Thus, religion can serve as a meaning system through which bereaved individuals are able to reframe their loss and even find avenues of personal growth.

If religion is linked to the ability to cope with stress better and if stress is linked to disease (as indicated earlier in the chapter), what then can be concluded about a possible indirect link between religion and disease?

Women have consistently shown a stronger interest in religion than men have. In the longitudinal study just described, the spirituality of women increased more than men in the second half of life (Wink & Dillon, 2002).

developmental **connection**

Religion. Religion plays an important role in the lives of many older adults. Chapter 18, p. 587

RELIGION AND HEALTH

What might be some of the effects of religion on physical health? Some cults and religious sects encourage behaviors that are damaging to health such as ignoring sound medical advice (Williams & Sternthal, 2007). For individuals in the religious mainstream, researchers increasingly are finding that religion is positively linked to health (Campbell, Yoon, & Johnstone, 2009; McCullough & Willoughby, 2009). Researchers have found that religious commitment helps to moderate blood pressure and hypertension, and that religious attendance is linked to a reduction in hypertension (Gillum & Ingram, 2007). Also, a number of studies have confirmed a positive association between religious participation and longevity (Oman & Thoresen, 2006). In *Connecting Development to Life* that follows, we explore links between religion and coping.

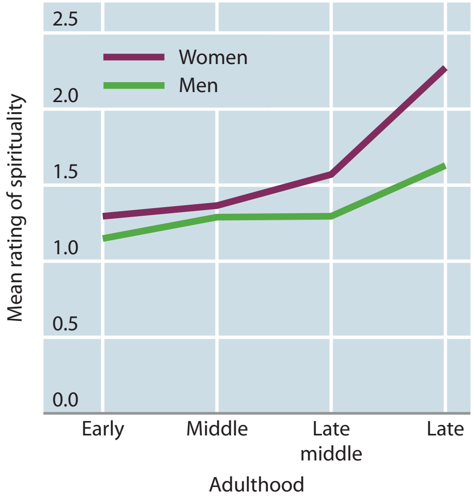


FIGURE **15.8**

LEVEL OF SPIRITUALITY IN FOUR ADULT AGE PERIODS. In a longitudinal study, the spirituality of individuals in four different adult age periods—early (thirties), middle (forties), late middle (mid-fifties/early sixties), and late (late sixties/early seventies) adulthood—was assessed (Wink & Dillon, 2002). Based on responses to open-ended questions in interviews, the spirituality of the individuals was coded on a 5-point scale with 5 being the highest level of spirituality and 1 the lowest.

connecting with careers

Gabriel Dy-Liacco, Pastoral Counselor

Gabriel Dy-Liacco is a pastoral counselor at the Pastoral Counseling and Consultation Centers of Greater Washington, DC. He obtained his Ph.D. in pastoral counseling from Loyola College in Maryland and also has experience as a psychotherapist in such mental health settings as a substance-abuse program, military family center, psychiatric clinic, and community mental health center. As a pastoral counselor, he works with adolescents and adults in the aspects of their lives that they show the most concern about—psychological, spiritual, or the interface of both. Having lived in Peru, Japan, and the Philippines, he brings considerable multicultural experience to the counseling setting, Dr. Dy-Liacco also is a professor in the Graduate School of Psychology and Counseling at Regent University in the Washington, DC, area.

In sum, various dimensions of religiousness can help some individuals cope more effectively with their lives (Park, 2010a, b). Religious counselors often advise people about mental health and coping. To read about the work of one religious counselor, see *Connecting With Careers*.

> When more time stretches before one, some assessments, however reluctantly and incompletely, begin to be made.
>
> —JAMES BALDWIN
>
> *American Novelist, 20th Century*

MEANING IN LIFE

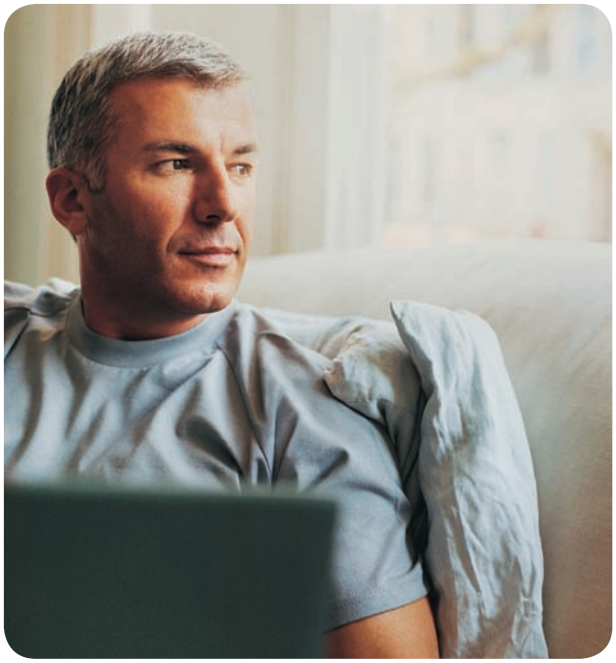
Austrian psychiatrist Viktor Frankl's mother, father, brother, and wife died in the concentration camps and gas chambers in Auschwitz, Poland. Frankl survived the concentration camp and went on to write about meaning in life. In his book *Man's Search for Meaning,* Frankl (1984) emphasized each person's uniqueness and the finiteness of life. He argued that examining the finiteness of our existence and the certainty of death adds meaning to life. If life were not finite, said Frankl, we could spend our life doing just about whatever we please because time would continue forever.

Frankl said that the three most distinct human qualities are spirituality, freedom, and responsibility. Spirituality, in his view, does not have a religious underpinning. Rather, it refers to a human being's uniqueness—to spirit, philosophy, and mind. Frankl proposed that people need to ask themselves such questions as why they exist, what they want from life, and what the meaning of their life is.

It is in middle adulthood that individuals begin to be faced with death more often, especially the deaths of parents and other older relatives. Also faced with less time in their life, many individuals in middle age begin to ask and evaluate the questions that Frankl proposed (Cohen, 2009). And, as we indicated in the discussion of religion and coping, meaning-making coping is especially helpful in times of chronic stress and loss.

Roy Baumeister and Kathleen Vohs (2002, pp. 610–611) argue that the quest for a meaningful life can be understood in terms of four main needs for meaning that guide how people try to make sense of their lives:

- *Need for purpose.* "Present events draw meaning from their connection with future events." Purposes can be divided into (1) goals and (2) fulfillments. Life can be oriented toward a future anticipated state, such as living happily ever after or being in love.
- *Need for values.* This "can lend a sense of goodness or positive characterization of life and justify certain courses of action. Values enable people to decide whether certain acts are right or wrong."



What characterizes the search for meaning in life?

Frankl's (1984) view of meaning in life emphasized value as the main form of meaning that people need.

- *Need for a sense of efficacy.* This involves the "belief that one can make a difference. A life that had purposes and values but no efficacy would be tragic. The person might know what is desirable but could not do anything with that knowledge." With a sense of efficacy, people believe that they can control their environment, which has positive physical and mental health benefits (Bandura, 2009).
- *Need for self-worth.* Most individuals want to be "good, worthy persons. Self-worth can be pursued individually."

Researchers are increasingly studying the factors involved in a person's exploration of meaning in life and whether developing a sense of meaning in life is linked to positive developmental outcomes. Research indicates that many individuals state that religion played an important role in increasing their exploration of meaning in life (Krause, 2008, 2009). Studies also suggest that individuals who have found a sense of meaning in life are more physically healthy and happier, and experience less depression, than their counterparts who report that they have not discovered meaning in life (Debats, 1990; Krause, 2004, 2009; Parquart, 2002).

Review *Connect* Reflect

LG5 Explain the roles of religion and meaning in life during middle adulthood.

Review

- What are some characteristics of religion in middle-aged individuals?
- How is religion linked to physical and mental health?
- What role does meaning in life play in middle adulthood?

Connect

- In this section, you read about religion and middle adulthood. In Chapter 12, what did you learn about the role of religion in adolescents' lives?

Reflect *Your Own Personal Journey of Life*

- How important is meaning in life to you at this point in your development? What do you think the most important aspects of meaning in life are?

topical **connections**

It is generally considered that people enter middle adulthood at about 40 to 45 years of age and exit it at approximately 60 to 65 years of age. However, as more adults are living healthier lives, middle age is starting later and lasting longer for an increasing number of individuals. Many physical characteristics decline in middle age but the decline usually is gradual. Cancer recently replaced cardiovascular disease as the leading cause of death in middle age. A majority of middle-aged adults show a moderate or strong interest in sex, although sexual intercourse occurs less frequently in middle-aged than in young adults. A number of cognitive processes (such as vocabulary) peak in middle adulthood, although some (such as perceptual speed) decline. Work continues to be an important aspect of the lives of most middle-aged adults. In middle adulthood, reflection about meaning in life increases.

looking **forward**

reach your **learning goals**

Physical and Cognitive Development in Middle Adulthood

1 The Nature of Middle Adulthood

LG1 Explain how midlife is changing, and define middle adulthood.

Changing Midlife

- As more people live to an older age, what we think of as middle age seems to be occurring later. A major reason developmentalists are beginning to study middle age is because of the dramatic increase in the number of individuals entering this period of the life span.

Defining Middle Adulthood

- Middle age involves extensive individual variation. With this variation in mind, we will consider middle adulthood to be entered at about 40 to 45 years of age and exited at approximately 60 to 65 years of age. Middle adulthood is the age period in which gains and losses as well as biological and sociocultural factors balance each other. Some experts conclude that sociocultural factors influence development in midlife more than biological factors.

2 Physical Development

LG2 Discuss physical changes in middle adulthood.

Physical Changes

- The physical changes of midlife are usually gradual. Genetic and lifestyle factors play important roles in whether chronic diseases will appear and when. Among the physical changes of middle adulthood are changes in physical appearance (wrinkles, aging spots); height (decrease) and weight (increase); strength, joints, and bones; vision and hearing; cardiovascular system; lungs; and sleep.

Health and Disease

- In middle age, the frequency of accidents declines and individuals are less susceptible to colds and allergies. Chronic disorders rarely appear in early adulthood, increase in middle adulthood, and become more common in late adulthood. Arthritis is the leading chronic disorder in middle age, followed by hypertension. Men have more fatal chronic disorders, women more nonfatal ones in middle age. Immune system functioning declines with aging. Emotional stress likely is an important factor contributing to cardiovascular disease. People who live in a chronically stressed condition are likelier to smoke, overeat, and not exercise. All of these stress-related behaviors are linked with cardiovascular disease. Culture plays an important role in coronary disease.

Mortality Rates

- In middle adulthood, chronic diseases are the main causes of death. Until recently, cardiovascular disease was the leading cause of death in middle age, but now cancer is the leading cause of death in this age group.

Sexuality

- Climacteric is the midlife transition in which fertility declines. The vast majority of women do not have serious physical or psychological problems related to menopause, which usually arrives in the late forties and early fifties, but menopause is an important marker because it signals the end of childbearing capability. Hormone replacement therapy (HRT) augments the declining levels of reproductive hormone production by the ovaries. HRT consists of various forms of estrogen, and usually progestin. Recent evidence of risks associated with HRT suggests that its long-term use should be seriously evaluated. Men do not experience an inability to father children in middle age, although their testosterone levels decline. A male menopause, like the dramatic decline in estrogen in women, does not occur. Sexual behavior occurs less frequently in middle adulthood than in early adulthood. Nonetheless, a majority of middle-aged adults show a moderate or strong interest in sex.

3 Cognitive Development

LG3 Identify cognitive changes in middle adulthood.

Intelligence

- Horn argued that crystallized intelligence (accumulated information and verbal skills) continues to increase in middle adulthood, whereas fluid intelligence (ability to reason abstractly) begins to decline. Schaie and Willis found that longitudinal assessments of intellectual abilities are less likely than cross-sectional assessments to find declines in middle adulthood and are even more likely to find improvements. The highest level of four intellectual abilities (vocabulary, verbal memory, inductive reasoning, and spatial orientation) occurred in middle age. Recent analysis shows considerable individual variation in intellectual abilities across middle adulthood and indicates that variations in some abilities are more predictive of cognitive impairment in late adulthood than others. Salthouse argues that decline in a number of cognitive functions begins in early adulthood and continues through the fifties. Decline in some aspects of neurobiological functioning that may be linked to age-related cognitive functioning has recently been found.

Information Processing

- Speed of information processing, often assessed through reaction time, continues to decline in middle adulthood. Although Schaie found that verbal memory increased in middle age, some researchers have found that memory declines in middle age. Working memory declines in late middle age. Memory is more likely to decline in middle age when individuals don't use effective strategies. Expertise involves having an extensive, highly organized knowledge and an understanding of a particular domain. Expertise often increases in the middle adulthood years. Practical problem solving remains stable in the early and middle adulthood years but declines in late adulthood.

4 Careers, Work, and Leisure

LG4 Characterize career development, work, and leisure in middle adulthood.

Work in Midlife

- For many people, midlife is a time of reflection, assessment, and evaluation of their current work and what they plan to do in the future. One important issue is whether individuals will continue to do the type of work they presently do or change jobs or careers.

Career Challenges and Changes

- The current middle-aged worker faces such challenges as the globalization of work, rapid developments in information technologies, downsizing of organizations, early retirement, and concerns about pensions and health care. Midlife job or career changes can be self-motivated or forced on individuals.

Leisure

- We not only need to learn to work well, but we also need to learn to enjoy leisure. Midlife may be an especially important time for leisure because of the physical changes that occur and because of preparation for an active retirement.

5 Religion and Meaning in Life

LG5 Explain the roles of religion and meaning in life during middle adulthood.

Religion and Adult Lives

- Religion is an important dimension of many Americans' lives. Women show a stronger interest in religion than men do. It is important to consider individual differences in religious interest.

Religion and Health

- In some cases, religion can be negatively linked to physical health, as when cults or religious sects discourage individuals from obtaining medical care. In mainstream religions, researchers are increasingly finding that religion is positively related to health. Religion can play an important role in coping for some individuals.

Meaning in Life

- Frankl argues that examining the finiteness of our existence leads to exploration of meaning in life. Faced with the death of older relatives and less time to live themselves, many middle-aged individuals increasingly examine life's meaning. Baumeister and Vohs argue that a quest for a meaningful life involves four main needs: purpose, values, efficacy, and self-worth.

key **terms**

middle adulthood 477	**menopause 484**	**fluid intelligence 488**	**meaning-making coping 494**
chronic disorders 482	**erectile dysfunction 485**	**working memory 491**	
climacteric 483	**crystallized intelligence 488**	**leisure 493**	

key **people**

Gilbert Brim 477	Sherry Willis 490	Nancy Denney 492	Viktor Frankl 496
John Horn 488	Timothy Salthouse 490	John Clausen 494	Roy Baumeister and Kathleen Vohs 496
K. Warner Schaie 488	Denise Park 491	Crystal Park 495	

chapter 16

SOCIOEMOTIONAL DEVELOPMENT IN MIDDLE ADULTHOOD

chapter **outline**

1 Personality Theories and Development

Learning Goal 1 Describe personality theories and development in middle adulthood.

Stages of Adulthood
The Life-Events Approach
Stress and Personal Control in Midlife
Contexts of Midlife Development

2 Stability and Change

Learning Goal 2 Discuss stability and change in development during middle adulthood, including longitudinal studies.

Longitudinal Studies
Conclusions

3 Close Relationships

Learning Goal 3 Identify some important aspects of close relationships in middle adulthood.

Love and Marriage at Midlife
The Empty Nest and Its Refilling
Sibling Relationships and Friendships
Grandparenting
Intergenerational Relationships

Forty-five-year-old Sarah feels tired, depressed, and angry when she looks back on the way her life has gone. She became pregnant when she was 17 and married Ben, the baby's father. They stayed together for three years after their son was born, and then Ben left her for another woman. Sarah went to work as a salesclerk to make ends meet. Eight years later, she married Alan, who had two children of his own from a previous marriage. Sarah stopped working for several years to care for the children. Then, like Ben, Alan started seeing someone else. She found out about it from a friend. Nevertheless, Sarah stayed with Alan for another year. Finally, he was gone so much that she could not take it anymore and decided to divorce him. Sarah went back to work again as a salesclerk; she has been in the same position for 16 years now. During those 16 years, she dated a number of men, but the relationships never seemed to work out. Her son never finished high school and has drug problems. Her father just died last year, and Sarah is trying to help her mother financially, although she can barely pay her own bills. Sarah looks in the mirror and does not like what she sees. She sees her past as a shambles, and the future does not look rosy, either.

Forty-five-year-old Wanda feels energetic, happy, and satisfied. As a young woman, she graduated from college and worked for three years as a high school math teacher. She married Andy, who had just finished law school. One year later, they had their first child, Josh. Wanda stayed home with Josh for two years, and then returned to her job as a math teacher. Even during her pregnancy, Wanda stayed active and exercised regularly, playing tennis almost every day. After her pregnancy, she kept up her exercise habits. Wanda and Andy had another child, Wendy. Now, as they move into their middle-age years, their children are both off at college, and Wanda and Andy are enjoying spending more time with each other. Last weekend, they visited Josh at his college, and the weekend before they visited Wendy at hers. Wanda continued working as a high school math teacher until six years ago. She had developed computer

topical **connections**

Emerging adulthood, which occurs from approximately 18 to 25 years of age, is a transitional period between adolescence and early adulthood, during which time individuals intensely explore their identity and experience instability in different contexts. A secure attachment style benefits young adults. Love and possibly marriage become central aspects of many young adults' socioemotional development. Searching for a balance between the need for independence and freedom and the need for intimacy and commitment characterizes the lives of many young adults. Many young adults not only are marrying later or not at all but are having children later than in past decades. Many young adults cohabit with a romantic partner.

looking ***back***

skills as part of her job and had taken some computer courses at a nearby college. She resigned her math teaching job and took a job with a computer company, where she has already worked her way into management. Wanda looks in the mirror and likes what she sees. She sees her past as enjoyable, although not without hills and valleys, and she looks to the future with enthusiasm.

preview

As with Sarah and Wanda, there are individual variations in the way people experience middle age. To begin the chapter, we will examine personality theories and development in middle age, including ideas about individual variation. Then we will turn our attention to how much individuals change or stay the same as they go through the adult years. Finally we will explore a number of aspects of close relationships during the middle adulthood years.

1 Personality Theories and Development

LG1 Describe personality theories and development in middle adulthood.

- Stages of Adulthood
- The Life-Events Approach
- Stress and Personal Control in Midlife
- Contexts of Midlife Development

What is the best way to conceptualize middle age? Is it a stage or a crisis? How extensively is middle age influenced by life events? Do middle-aged adults experience stress and personal control differently than young and older adults? Is personality linked with contexts such as the point in history in which individuals go through midlife, their culture, and their gender?

STAGES OF ADULTHOOD

Adult stage theories have been plentiful, and they have contributed to the view that midlife brings a crisis in development. Two prominent theories that define stages of adult development are Erik Erikson's life-span view and Daniel Levinson's seasons of a man's life.

> The generations of living things pass in a short time, and like runners, hand on the torch of life.
>
> —LUCRETIUS
>
> *Roman Poet, 1st Century B.C.*

Erikson's Stage of Generativity Versus Stagnation Erikson (1968) proposed that middle-aged adults face a significant issue—generativity versus stagnation, which is the name Erikson gave to the seventh stage in his life-span theory. *Generativity* encompasses adults' desire to leave legacies of themselves to the next generation (Petersen, 2002). Through these legacies adults achieve a kind of immortality. By contrast, *stagnation* (sometimes called "self-absorption") develops when individuals sense that they have done nothing for the next generation.

Middle-aged adults can develop generativity in a number of ways (Kotre, 1984). Through biological generativity, adults have offspring. Through parental generativity, adults nurture and guide children. Through work generativity, adults develop skills that are passed down to others. And through cultural generativity, adults create, renovate, or conserve some aspect of culture that ultimately survives.

Adults promote and guide the next generation by parenting, teaching, leading, and doing things that benefit the community (Pratt & others, 2008a, b). One of the participants in a study of aging said: "From twenty to thirty I learned how to

developmental **connection**

Personality. Erikson's early adulthood stage is intimacy versus isolation and his late adulthood stage is integrity versus despair. Chapter 14, p. 452; Chapter 19, p. 594

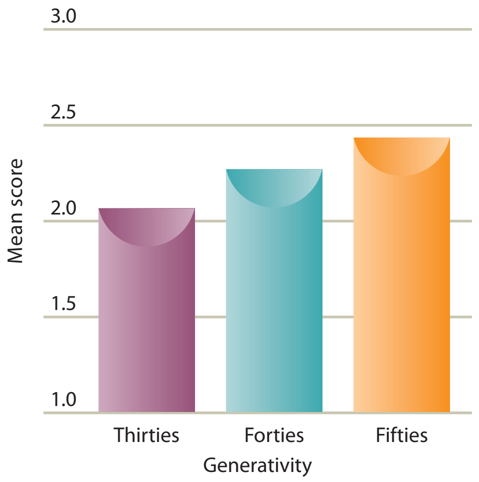


FIGURE **16.1**

CHANGES IN GENERATIVITY FROM THE THIRTIES THROUGH THE FIFTIES. Generativity increased in Smith College women as they aged from their thirties through their fifties (Stewart, Ostrove, & Helson, 2001). The women rated themselves on a 3-point scale indicating the extent to which they thought the statements about generativity were descriptive of their lives. Higher scores reflect greater generativity.

developmental **connection**

Identity. Identity development is a key aspect of adolescents' and emerging adults' lives. Chapter 12, p. 383

get along with my wife. From thirty to forty I learned how to be a success at my job, and at forty to fifty I worried less about myself and more about the children" (Vaillant, 2002, p. 114). Generative adults commit themselves to the continuation and improvement of society as a whole through their connection to the next generation. Generative adults develop a positive legacy of the self and then offer it as a gift to the next generation.

Does research support Erikson's theory that generativity is an important dimension of middle age? Yes, it does (Gramling, 2007; McAdams & Olson, 2010; Pratt & others, 2008a, b). A longitudinal study of individuals from their college years through age 43 revealed that Erikson's stage of generativity versus stagnation showed a pattern of slow but steady increase in becoming more generative (Whitbourne, Sneed, & Sayer, 2009). Another study revealed that parents' generativity was linked to the successful development of their children as young adults (Peterson, 2006). In this study, parents who were generative had young adult children who were conscientious and agreeable.

In another study, Carol Ryff (1984) examined the views of women and men at different ages and found that middle-aged adults especially were concerned about generativity. In yet another study, generative women with careers found gratification through work; generative women who had not worked in a career experienced gratification through parenting (Peterson & Stewart, 1996). And in a longitudinal study of Smith College women, generativity increased from the thirties through the fifties (Stewart, Ostrove, & Helson, 2001; Zucker, Ostrove, & Stewart, 2002) (see Figure 16.1). In this longitudinal study, identity certainty also increased from the thirties through the fifties and having a positive identity was linked with generativity in middle age (Vandewater, Ostrove, & Stewart, 1997). Figure 16.2 describes the items that were used to assess generativity and identity certainty in the Smith College Study.

Levinson's Seasons of a Man's Life In *The Seasons of a Man's Life* (1978), clinical psychologist Daniel Levinson reported the results of extensive interviews with 40 middle-aged men. The interviews were conducted with hourly workers, business executives, academic biologists, and novelists. Levinson bolstered his conclusions with information from the biographies of famous men and the development of memorable characters in literature. Although Levinson's major interest focused on midlife change, he described a number of stages and transitions during the period from 17 to 65 years of age, as shown in Figure 16.3. Levinson emphasizes that developmental tasks must be mastered at each stage.

FIGURE **16.2**

ITEMS USED TO ASSESS GENERATIVITY AND IDENTITY CERTAINTY. These items were used to assess generativity and identity certainty in the longitudinal study of Smith College women (Stewart, Ostrove, & Helson, 2001). In the assessment of identity certainty, five of the items involved reversed scoring. For example, if an individual scored high on the item "Searching for a sense of who I am," it was an indication of identity uncertainty rather than identity certainty.

Generativity

- Feeling needed by people
- Effort to ensure that young people get their chance to develop
- Influence in my community or area of interest
- A new level of productivity or effectiveness
- Appreciation and awareness of older people
- Having a wider perspective
- Interest in things beyond my family

Identity certainty

- A sense of being my own person
- Excitement, turmoil, confusion about my impulses and potential (reversed)
- Coming near the end of one road and not yet finding another (reversed)
- Feeling my life is moving well
- Searching for a sense of who I am (reversed)
- Wishing I had a wider scope to my life (reversed)
- Anxiety that I won't live up to opportunities (reversed)
- Feeling secure and committed

At the end of one's teens, according to Levinson, a transition from dependence to independence should occur. This transition is marked by the formation of a dream—an image of the kind of life the youth wants to have, especially in terms of a career and marriage. Levinson sees the twenties as a *novice phase* of adult development. It is a time of reasonably free experimentation and of testing the dream in the real world. In early adulthood, the two major tasks to be mastered are exploring the possibilities for adult living and developing a stable life structure.

From about the ages of 28 to 33, a man goes through a transition period in which he must face the more serious question of determining his goals. During the thirties, he usually focuses on family and career development. In the later years of this period, he enters a phase of *Becoming One's Own Man* (or BOOM, as Levinson calls it). By age 40, he has reached a stable location in his career, has outgrown his earlier, more tenuous attempts at learning to become an adult, and now must look forward to the kind of life he will lead as a middle-aged adult.

According to Levinson, the transition to middle adulthood lasts about five years (ages 40 to 45) and requires the adult male to come to grips with four major conflicts that have existed in his life since adolescence: (1) being young versus being old, (2) being destructive versus being constructive, (3) being masculine versus being feminine, and (4) being attached to others versus being separated from them. Seventy to 80 percent of the men Levinson interviewed found the midlife transition tumultuous and psychologically painful, as many aspects of their lives came into question. According to Levinson, the success of the midlife transition rests on how effectively the individual reduces the polarities and accepts each of them as an integral part of his being.

Because Levinson interviewed middle-aged men, we can consider the data about middle adulthood more valid than the data about early adulthood. When individuals are asked to remember information about earlier parts of their lives, they may distort and forget things. The original Levinson data included no women, although Levinson (1996) reported that his stages, transitions, and the crisis of middle age hold for women as well as men. Levinson's work included no statistical analysis. However, the quality and quantity of the Levinson biographies make them outstanding examples of the clinical tradition.

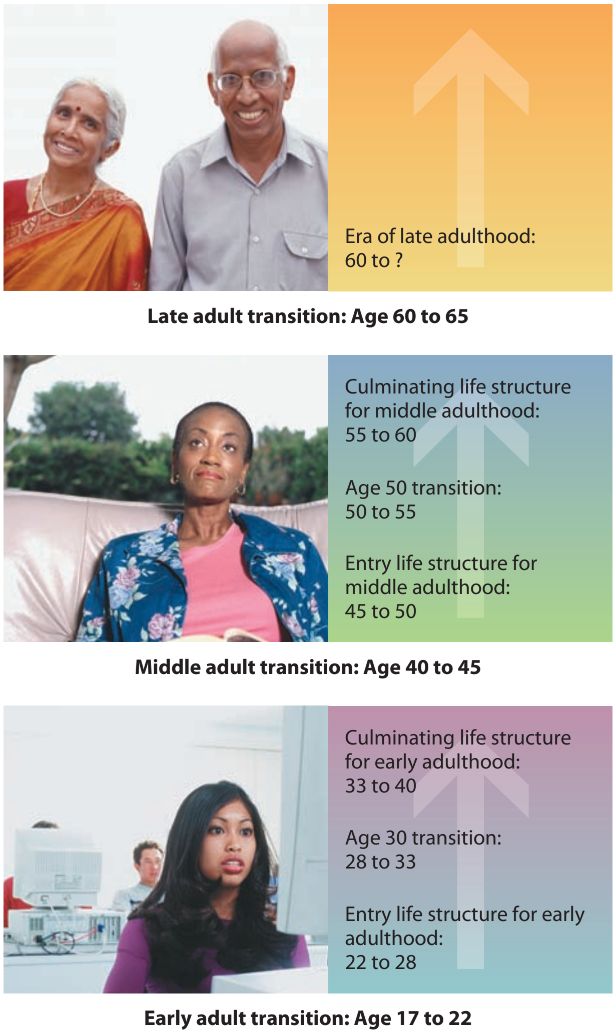

Era of late adulthood:
60 to ?
Late adult transition: Age 60 to 65
Culminating life structure for middle adulthood:
55 to 60
Age 50 transition:
50 to 55
Entry life structure for middle adulthood:
45 to 50
Middle adult transition: Age 40 to 45
Culminating life structure for early adulthood:
33 to 40
Age 30 transition:
28 to 33
Entry life structure for early adulthood:
22 to 28
Early adult transition: Age 17 to 22

FIGURE **16.3**

LEVINSON'S PERIODS OF ADULT DEVELOPMENT. According to Levinson, adulthood for men has three main stages, which are surrounded by transition periods. Specific tasks and challenges are associated with each stage.

How Pervasive Are Midlife Crises? Levinson (1978) views midlife as a crisis, arguing that the middle-aged adult is suspended between the past and the future, trying to cope with this gap that threatens life's continuity. George Vaillant (1977) has a different view. Vaillant's study—called the "Grant Study"—involved Harvard University men in their early thirties and in their late forties who initially had been interviewed as undergraduates. He concludes that just as adolescence is a time for detecting parental flaws and discovering the truth about childhood, the forties are a decade of reassessing and recording the truth about the adolescent and adulthood years. However, whereas Levinson sees midlife as a crisis, Vaillant maintains that only a minority of adults experience a midlife crisis:

> Just as pop psychologists have reveled in the not-so-common high drama of adolescent turmoil, also the popular press, sensing good copy, had made all too much of the mid-life crisis. The term mid-life crisis brings to mind some variation of the renegade minister who leaves behind four children and the congregation that loved him in order to drive off in a magenta Porsche with a 25-year-old striptease artiste. As with adolescent turmoil, mid-life crises are much rarer in community samples. (pp. 222–223)

Thus, for most people midlife is not a crisis (Pudrovska, 2009). As we saw in Chapter 15, many cognitive skills, such as vocabulary, verbal memory, and inductive reasoning, peak in midlife, and many individuals reach the height of their career

Mid-life crises are greatly exaggerated in America.

—George Vaillant

Contemporary Psychologist, Harvard University

developmental **connection**

Stress. Adolescence has been characterized too negatively, dating from Hall's storm and stress view of adolescents. Chapter 11, p. 352

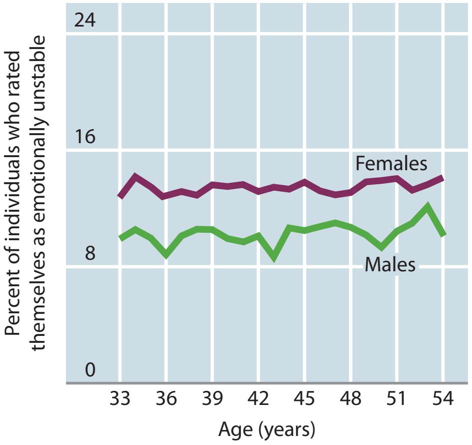


FIGURE 16.4

EMOTIONAL INSTABILITY AND AGE. In one longitudinal study, the emotional instability of individuals was assessed from age 33 to age 54 (McCrae & Costa, 1990). No significant increase in emotional instability occurred during the middle-aged years.

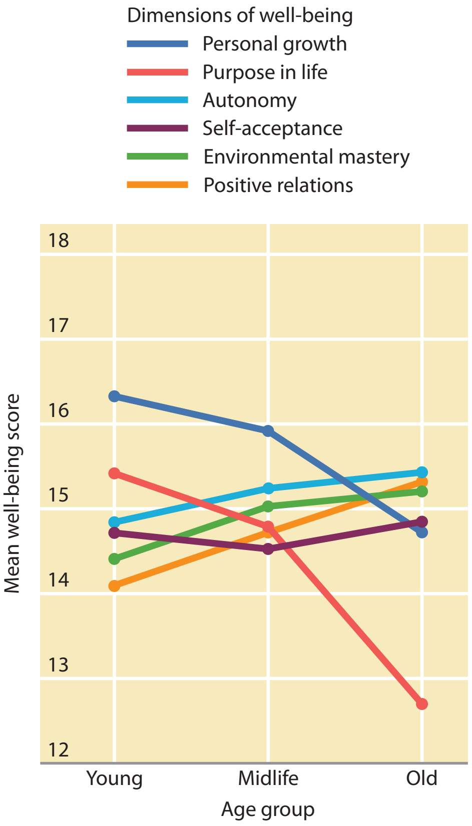


FIGURE 16.5

AGE AND WELL-BEING. In one study, six dimensions of well-being (self-acceptance, positive relations, personal growth, purpose in life, environmental mastery, and autonomy) were assessed in three different age groups of individuals (young adults, middle-aged adults, and older adults) (Keyes & Ryff, 1998). An increase or little change in most of the dimensions of well-being occurred during middle adulthood.

success in midlife. Further, in midlife, reports of general well-being and life satisfaction tend to be high (Martin, Grunendahl, & Martin, 2001).

Further, the following research studies all document that midlife is not characterized by pervasive crises:

- One study found that 26 percent of middle-aged U.S. adults said they had experienced a midlife crisis, but most attributed the crisis to negative life events rather than aging (Wethington, Kessler, & Pixley, 2004).
- A longitudinal study of more than 2,000 individuals found few midlife crises (McCrae & Costa, 1990; Siegler & Costa, 1999). In this study, the emotional instability of individuals did not significantly increase through their middle-aged years (see Figure 16.4).
- A study of individuals described as young (average age 19), middle-aged (average age 46), and older (average age 73) adults found that their ability to master their environment, autonomy, and personal relations improved during middle age (Keyes & Ryff, 1998) (see Figure 16.5).

Adult development experts are virtually unanimous in their belief that midlife crises have been exaggerated (Brim, Ryff, & Kessler, 2004; Lachman, 2004; Pudrovska, 2009; Wethington, Kessler, & Pixley, 2004). In sum:

- The stage theories place too much emphasis on crises in development, especially midlife crises.
- There often is considerable individual variation in the way people experience the stages, a topic that we will turn to next.

Individual Variations Stage theories focus on the universals of adult personality development as they try to pin down stages that all individuals go through in their adult lives. These theories do not adequately address individual variations in adult development. One extensive study of a random sample of 500 men at midlife, for example, found extensive individual variation among men (Farrell & Rosenberg, 1981). In the individual variations view, middle-aged adults interpret, shape, alter, and give meaning to their lives.

Some individuals may experience a midlife crisis in some contexts of their lives but not others (Lachman, 2004). For example, turmoil and stress may characterize a person's life at work even while things are going smoothly at home.

Researchers have found that in one-third of the cases in which individuals have reported having a midlife crisis, the "crisis is triggered by life events such as a job loss, financial problems, or illness" (Lachman, 2004, p. 315). Let's now explore the role of life events in midlife development.

THE LIFE-EVENTS APPROACH

Age-related stages represent one major way to examine adult personality development. A second major way to conceptualize adult personality development is to focus on life events (Serido, 2009). In the early version of the life-events approach, life events were viewed as taxing circumstances for individuals, forcing them to change their personality (Holmes & Rahe, 1967). Such events as the death of a spouse, divorce, marriage, and so on were believed to involve varying degrees of stress, and therefore likely to influence the individual's development.

Today's life-events approach is more sophisticated. In the **contemporary life-events approach,** how life events influence the individual's development depends not only on the life event itself but also on mediating factors (such as physical health and family supports), the individual's adaptation to the life event (such as appraisal of the threat and coping strategies), the life-stage context, and the sociohistorical context (see Figure 16.6). For example, if individuals are in poor health and have little family support, life events are likely to be more stressful. And a divorce may be more stressful after many years of marriage when adults are in their fifties than when they have been married only several years and are in their twenties, a finding indicating that the life-stage context of an event makes a difference. The sociohistorical context also makes a difference. For example, adults may be able to cope more effectively with divorce today than in the 1950s because divorce has become more commonplace and accepted in today's society. Whatever the context or mediating variables, however, one individual may perceive a life event as highly stressful, whereas another individual may perceive the same event as a challenge.

Though the life-events approach is a valuable addition to understanding adult development, like other approaches to adult development it has its drawbacks. One of the most significant drawbacks is that the life-events approach places too much emphasis on change, not adequately recognizing the stability that, at least to some degree, characterizes adult development.

Another drawback of the life-events approach is that it may not be life's major events that are the primary sources of stress, but our daily experiences (O'Connor & others, 2009). Enduring a boring but tense job or marriage and living in poverty do not show up on scales of major life events. Yet the everyday pounding we take from these living conditions can add up to a highly stressful life and eventually illness.

Some psychologists conclude that we can gain greater insight into the source of life's stresses by focusing less on major events and more on daily hassles and daily uplifts (McIntosh, Gillanders, & Rodgers, 2010; Neupert, Almeida, & Charles, 2007). One study found that the most frequent daily hassles of college students were wasting time, concerns about meeting high standards, and being lonely (Kanner & others, 1981). Among the most frequent uplifts of the college students were entertainment, getting along well with friends, and completing a task. In this same study, the most frequent daily hassles of middle-aged adults were concerns about weight and the health of a family member, while their most frequent daily uplifts involved relating well with a spouse or lover, or a friend (see Figure 16.7). And the middle-aged adults were more likely than the college students to report that their daily hassles involved economic concerns (rising prices and taxes, for example).

Critics of the daily hassles approach argue that some of the same problems involved with life-events scales occur when daily hassles are assessed. For example, knowing about an adult's daily hassles tells us nothing about physical changes, about how the individual copes with hassles, or about how the individual perceives hassles.

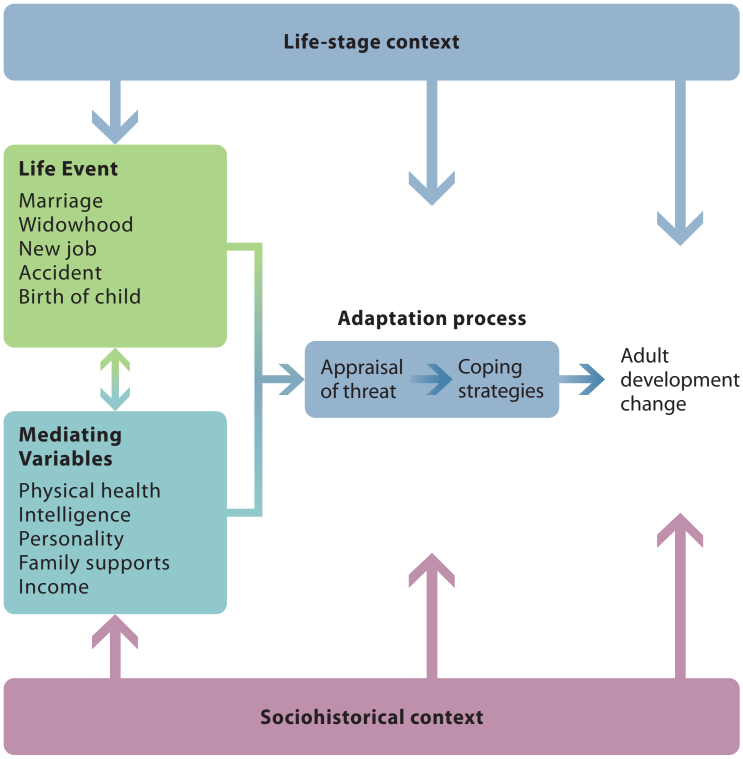


FIGURE **16.6**

A CONTEMPORARY LIFE-EVENTS FRAMEWORK FOR INTERPRETING ADULT DEVELOPMENTAL CHANGE. According to the contemporary life-events approach, the influence of a life event depends on the event itself, on mediating variables, on the life-stage and sociohistorical context, and on the individual's appraisal of the event and coping strategies.

STRESS AND PERSONAL CONTROL IN MIDLIFE

As we have seen, there is conclusive evidence that midlife is not a time when a majority of adults experience a tumultuous crisis, and when they do experience a midlife crisis it is often linked to stressful life events. Do middle-aged adults experience stress differently from young adults and older adults? One study using daily diaries over a one-week period found that both young and middle-aged adults had more days that were stressful and that were characterized by multiple stresses than older adults (Almeida & Horn, 2004). In this study, although young adults experienced daily stressors more frequently than middle-aged adults, middle-aged adults experienced more "overload" stressors that involved juggling too many activities at once. A recent study also revealed that middle-aged and older adults showed a smaller increase in

contemporary life-events approach Approach emphasizing that how a life event influences the individual's development depends not only on the life event, but also on mediating factors, the individual's adaptation to the life event, the life-stage context, and the sociohistorical context.

Daily Hassles	**Percentage of Times Checked**
Concerns about weight	52.4
Health of family member	48.1
Rising prices of common goods	43.7
Home maintenance	42.8
Too many things to do	38.6
Misplacing or losing things	38.1
Yardwork/outside home maintenance	38.1
Property, investment, or taxes	37.6
Crime	37.1
Physical appearance	35.9

Daily Uplifts	
Relating well with your spouse or lover	76.3
Relating well with friends	74.4
Completing a task	73.3
Feeling healthy	72.7
Getting enough sleep	69.7
Eating out	68.4
Meeting your responsibilities	68.1
Visiting, phoning, or writing someone	67.7
Spending time with family	66.7
Home (inside) pleasing to you	65.5

FIGURE **16.7**

THE TEN MOST FREQUENT DAILY HASSLES AND UPLIFTS OF MIDDLE-AGED ADULTS OVER A NINE-MONTH PERIOD. *How do these hassles and uplifts compare with your own?*

psychological distress to interpersonal stressors than did younger adults, and middle-aged adults were less physically reactive to work stressors than were younger adults (Neupert, Almeida, & Charles, 2007).

To what extent do middle-aged adults perceive that they can control what happens to them? Researchers have found that on average a sense of personal control decreases as adults become older (Lachman, 2006). In one study, approximately 80 percent of the young adults (25 to 39 years of age), 71 percent of the middle-aged adults (40 to 59 years of age), and 62 percent of the older adults (60 to 75 years of age) reported that they were often in control of their lives (Lachman & Firth, 2004). However, some aspects of personal control increase with age while others decrease (Lachman, 2006). For example, middle-aged adults feel they have a greater sense of control over their finances, work, and marriage than younger adults but less control over their sex life and their children (Lachman & Firth, 2004).

CONTEXTS OF MIDLIFE DEVELOPMENT

Both Sarah and Wanda, whose stories appeared at the opening to this chapter, are working mothers. In almost every other way, however, their lives could scarcely be more different. Why? Part of the answer might lie in the different contexts of their lives. The contemporary life-events approach (like Bronfenbrenner's theory, discussed in Chapter 1) highlights the importance of the complex setting of our lives—of everything from our income and family supports to our sociohistorical circumstances. Let's examine how three aspects of the contexts of life influence development during middle adulthood: historical contexts (cohort effects), gender, and culture.

Historical Contexts (Cohort Effects) Some developmentalists conclude that changing historical times and different social expectations influence how different cohorts—groups of individuals born in the same year or time period—move through the life span (Schaie, 2010, 2011). Bernice Neugarten (1986) argues that our values, attitudes, expectations, and behaviors are influenced by the period in which we live. For example, individuals born during the difficult times of the Great Depression may have a different outlook on life than those born during the optimistic 1950s, says Neugarten.

developmental **connection**

Research Methods. Cohort effects have also been described as normative, history-graded influences. Chapter 1, p. 36

Neugarten (1986) holds that the social environment of a particular age group can alter its **social clock**—the timetable according to which individuals are expected to accomplish life's tasks, such as getting married, having children, or establishing themselves in a career. Social clocks provide guides for our lives; individuals whose lives are not synchronized with these social clocks find life to be more stressful than those who are on schedule, says Neugarten. For example, the fact that Sarah's pregnancy occurred when she was a teenager probably increased the stressfulness of that pregnancy. Neugarten argues that today there is much less agreement than in the past on the right age or sequence for the occurrence of major life events such as having children or retiring. Indeed, one study found that, between the late 1950s and the late 1970s, there was a dramatic decline in adults' beliefs that there is a "best age" for major life events and achievements (Passuth, Maines, & Neugarten, 1984) (see Figure 16.8).

social clock The timetable according to which individuals are expected to accomplish life's tasks, such as getting married, having children, or establishing themselves in a career.

Gender Contexts Critics say that the stage theories of adult development have a male bias. For example, the central focus of stage theories is on career choice and work achievement, which historically have dominated men's life choices and life chances more than women's. The stage theories do not adequately address women's concerns about relationships, interdependence, and caring (Gilligan, 1982). The

Late '50s Study

Late '70s Study

Activity/event	Appropriate age range	Percent who agree (late '50s study)		Percent who agree (late '70s study)	
		Men	Women	Men	Women
Best age for a man to marry	20–25	80	90	42	42
Best age for a woman to marry	19–24	85	90	44	36
When most people should become grandparents	45–50	84	79	64	57
Best age for most people to finish school and go to work	20–22	86	82	36	38
When most men should be settled on a career	24–26	74	64	24	26
When most men hold their top jobs	45–50	71	58	38	31
When most people should be ready to retire	60–65	83	86	66	41
When a man has the most responsibilities	35–50	79	75	49	50
When a man accomplishes most	40–50	82	71	46	41
The prime of life for a man	35–50	86	80	59	66
When a woman has the most responsibilities	25–40	93	91	59	53
When a woman accomplishes the most	30–45	94	92	57	48

FIGURE **16.8**

INDIVIDUALS' CONCEPTIONS OF THE BEST AGE FOR MAJOR LIFE EVENTS AND ACHIEVEMENTS: LATE 1950s AND LATE 1970s. *What do you think is the best age to experience these major life events and accomplishments?*

adult stage theories have also placed little importance on childbearing and child rearing. Women's family roles are complex and often have a higher salience in their lives than in men's lives. The role demands that women experience in balancing career and family are usually not experienced as intensely by men. And the type of stressors experienced by middle-aged women and men may differ. One study revealed that middle-aged women had more interpersonal stressors, whereas their male counterparts had more self-focused stressors (Almeida & Horn, 2004).

Should midlife and the years beyond be feared by women as bringing the loss of youth and opportunity, a time of decline? Or is it a new prime of life, a time for renewal, for shedding preoccupations with a youthful appearance and body, and for seeking new challenges, valuing maturity, and enjoying change?

In one study, the early fifties were indeed a new prime of life for many women (Mitchell & Helson, 1990). In the sample of 700 women aged 26 to 80, women in their early fifties most often described their lives as "first-rate." Conditions that distinguished the lives of women in their early fifties from those of women in other age periods included more "empty nests," better health, higher income, and more concern for parents. Women in their early fifties showed confidence, involvement, security, and breadth of personality.

In sum, the view that midlife is a negative age period for women is stereotypical, as so many perceptions of age periods are. Midlife is a diversified, heterogeneous period for women, just as it is for men.

developmental **connection**

Moral Development. The care perspective is Gilligan's view of the importance in moral development of viewing people in terms of their connectedness with others. Chapter 10, p. 323

Critics say the stage theories of adult development have a male bias by emphasizing career choice and achievement, and that they do not adequately address women's concerns about relationships, interdependence, and caring. The stage theories assume a normative sequence of development, but as women's roles have become more varied and complex, determining what is normative is difficult. *What kinds of changes have taken place in middle-aged women's lives in recent years?*

Gusii dancers perform on habitat day in Nairobi, Kenya. Movement from one status to another in the Gusii culture is due primarily to life events, not age. The Gusii do not have a clearly labeled midlife transition.

Cultural Contexts In many cultures, especially nonindustrialized cultures, the concept of middle age is not very clear, or in some cases is absent. It is common in nonindustrialized societies to describe individuals as young or old, but not as middle-aged (Grambs, 1989). Some cultures have no words for "adolescent," "young adult," or "middle-aged adult."

Consider the Gusii culture, located south of the equator in the African country of Kenya. The Gusii divide the life course differently for females and males (LeVine, 1979): females: (1) infant, (2) uncircumcised girl, (3) circumcised girl, (4) married woman, and (5) female elder; males: (1) infant, (2) uncircumcised boy, (3) circumcised boy warrior, and (4) male elder. Thus, movement from one status to the next is due primarily to life events, not age, in the Gusii culture.

Although the Gusii do not have a clearly labeled midlife transition, some of the Gusii adults do reassess their lives around the age of 40. At this time, these Gusii adults examine their current status and the limited time they have remaining in their lives. Their physical strength is decreasing, and they know they cannot farm their land forever, so they seek spiritual powers by becoming ritual practitioners or healers. As in the American culture, however, a midlife crisis in the Gusii culture is the exception rather than the rule.

What is middle age like for women in other cultures? It depends on the modernity of the culture and the culture's view of gender roles. Some anthropologists conclude that when women become middle-aged in nonindustrialized societies they may experience certain advantages (Brown, 1985). First, they are often freed from cumbersome restrictions that were placed on them when they were younger. For example, in middle age they enjoy greater geographical mobility. Child care has ceased or can be delegated, and domestic chores are reduced. They may venture forth from the village for commercial opportunities, visits to relatives living at a distance, and religious events. Second, with middle age a woman has the right to exercise authority over specified younger kin. Middle-aged women can extract labor from younger family members. The work of middle-aged women tends to be administrative, delegating tasks and making assignments to younger women. Middle-aged women also make important decisions for certain members of the younger generation: what a grandchild is to be named, who is ready to be initiated, and who is eligible to marry whom. A third major change brought on by middle age in nonindustrialized societies is eligibility for special statuses and the possibility that these provide recognition beyond the household. These statuses include the vocations of midwife, curer, holy woman, and matchmaker.

Review *Connect* Reflect

LG1 Describe personality theories and development in middle adulthood.

Review

- What are some theories of adult stages of development?
- What is the life-events approach?
- How do middle-aged adults experience stress and personal control differently than young and older adults?
- How do contexts influence midlife development?

Connect

- In this section, you read that some researchers criticize the stage theories of adult development as having a male bias. What did you learn about gender bias in research in Chapter 1?

Reflect *Your Own Personal Journey of Life*

- Which approach makes more sense—adult stage or life events—in explaining your own development as you go through adulthood? Or do you think both approaches should be considered in understanding your adult development? Explain your answer.

2 Stability and Change

LG2 Discuss stability and change in development during middle adulthood, including longitudinal studies.

Longitudinal Studies

Conclusions

Sarah's adult life, described in the chapter opening, has followed a painful path. Were her sorrows inevitable as a result of how she learned to cope with problems earlier in life? Is it possible for her, in middle age, to change her coping strategies or how she relates to other people? Recall from Chapter 1 that questions like these about stability and change are an important issue in life-span development.

LONGITUDINAL STUDIES

We will examine four longitudinal studies to help us understand the extent to which there is stability or change in adult development: Costa and McCrae's Baltimore Study, the Berkeley Longitudinal Studies, Helson's Mills College Study, and Vaillant's studies.

Costa and McCrae's Baltimore Study A major study of adult personality development continues to be conducted by Paul Costa and Robert McCrae (1998; McCrae & Costa, 2003, 2006). They focus on what are called the **Big Five factors of personality,** which are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (emotional stability); they are described in Figure 16.9. (Notice that if you create an acronym from these factor names, you will get the word *OCEAN*.) A number of research studies point toward these factors as important dimensions of personality (Costa & McCrae, 1998; McCrae & Costa, 2003, 2006).

Using their five-factor personality test, Costa and McCrae (1995, 2000) studied approximately 1,000 college-educated men and women ages 20 to 96, assessing the same individuals over many years. Data collection began in the 1950s to the mid-1960s and is ongoing. Costa and McCrae concluded that considerable stability occurs in the five personality factors—emotional stability, extraversion, openness, agreeableness, and conscientiousness. However, one study found that conscientiousness continued to develop in late adulthood (Roberts, Walton, & Bogg, 2005), and another study revealed that older adults were more conscientious and agreeable than middle-aged and younger adults (Allemand, Zimprich, & Hendriks, 2008).

Big Five factors of personality Emotional stability (neuroticism), extraversion, openness to experience, agreeableness, and conscientiousness.

Openness
- Imaginative or practical
- Interested in variety or routine
- Independent or conforming

Conscientiousness
- Organized or disorganized
- Careful or careless
- Disciplined or impulsive

Extraversion
- Sociable or retiring
- Fun-loving or somber
- Affectionate or reserved

Agreeableness
- Softhearted or ruthless
- Trusting or suspicious
- Helpful or uncooperative

Neuroticism (emotional stability)
- Calm or anxious
- Secure or insecure
- Self-satisfied or self-pitying

FIGURE **16.9**

THE BIG FIVE FACTORS OF PERSONALITY. Each of the broad supertraits encompasses more narrow traits and characteristics. Use the acronym OCEAN to remember the Big Five personality factors (openness, conscientiousness, extraversion, agreeableness, neuroticism).

A meta-analysis of personality stability and change organized according to the Big-Five framework included 87 longitudinal studies spanning 10 to 101 years of age (Roberts, Walton, & Viechtbauer, 2006). This analysis found that:

- Results for extraversion were complex until it was subdivided into social dominance (assertiveness, dominance) and social vitality (talkativeness, sociability). Social dominance increased from adolescence through middle adulthood, whereas social vitality increased in adolescence and then decreased in early and late adulthood.
- Agreeableness and conscientiousness increased in early and middle adulthood.
- Neuroticism decreased in early adulthood.
- Openness to experience increased in adolescence and early adulthood and then decreased in late adulthood.

In general, personality traits changed most during early adulthood.

Berkeley Longitudinal Studies In the Berkeley Longitudinal Studies, more than 500 children and their parents were initially studied in the late 1920s and early 1930s. The book *Present and Past in Middle Life* (Eichorn & others, 1981) profiles these individuals as they became middle-aged. The results from early adolescence through a portion of midlife did not support either extreme in the debate over whether personality is characterized by stability or change. Some characteristics were more stable than others, however. The most stable characteristics were the degree to which individuals were intellectually oriented, self-confident, and open to new experiences. The characteristics that changed the most included the extent to which the individuals were nurturant or hostile and whether or not they had good self-control.

John Clausen (1993), one of the researchers in the Berkeley Longitudinal Studies, stresses that too much attention has been given to discontinuities for all members of the human species, as exemplified in the adult stage theories. Rather, he considers that some people experience recurrent crises and change a great deal over the life course, whereas others have more stable, continuous lives and change far less.

Helson's Mills College Study Another longitudinal investigation of adult personality development was conducted by Ravenna Helson and her colleagues (Helson, 1997; Helson & Wink, 1992; Stewart, Osgrove, & Helson, 2001). They initially studied 132 women who were seniors at Mills College in California in the late 1950s and then studied them again when they were in their thirties, forties, and fifties. Helson and her colleagues distinguished three main groups among the Mills women: family-oriented, career-oriented (whether or not they also wanted families), and those who followed neither path (women without children who pursued only low-level work).

During their early forties, many of the women shared the concerns that stage theorists such as Levinson found in men: concern for young and old, introspectiveness, interest in roots, and awareness of limitations and death. However, the researchers in the Mills College Study concluded that rather than being in a midlife crisis, the women were experiencing *midlife consciousness.* The researchers also indicated that commitment to the tasks of early adulthood—whether to a career or family (or both)—helped women learn to control their impulses, develop interpersonal skills, become independent, and work hard to achieve goals. Women who did not commit themselves to one of these lifestyle patterns faced fewer challenges and did not develop as fully as the other women (Rosenfeld & Stark, 1987).

In the Mills College Study, some women moved toward becoming "pillars of society" in their early forties to early fifties. Menopause, caring for aging parents, and an empty nest were not associated with an increase in responsibility and self-control (Helson & Wink, 1992). The identity certainty and awareness of aging of the Mills College women increased from their thirties through their fifties (Stewart, Osgrove, & Helson, 2001).

George Vaillant's Studies Longitudinal studies by George Vaillant help us examine a somewhat different question than the studies described so far: Does personality at middle age predict what a person's life will be like in late adulthood? Vaillant (2002) has conducted three longitudinal studies of adult development and aging: (1) a sample of 268 socially advantaged Harvard graduates born about 1920 (called the Grant Study); (2) a sample of 456 socially disadvantaged inner-city men born about 1930; and (3) a sample of 90 middle-SES, intellectually gifted women born about 1910. These individuals have been assessed numerous times (in most cases, every two years), beginning in the 1920s to 1940s and continuing today for those still living. The main assessments involve extensive interviews with the participants, their parents, and teachers.

Vaillant categorized 75- to 80-year-olds as "happy-well," "sad-sick," and "dead." He used data collected from these individuals when they were 50 years of age to predict which categories they were likely to end up in at 75 to 80 years of age. Alcohol abuse and smoking at age 50 were the best predictors of which individuals would be dead at 75 to 80 years of age. Other factors at age 50 were linked with being in the "happy-well" category at 75 to 80 years of age: getting regular exercise, avoiding being overweight, being well-educated, having a stable marriage, being future-oriented, being thankful and forgiving, empathizing with others, being active with other people, and having good coping skills.

Wealth and income at age 50 were not linked with being in the "happy-well" category at 75 to 80 years of age. Generativity in middle age (defined as "taking care of the next generation") was more strongly related than intimacy to whether individuals would have an enduring and happy marriage at 75 to 80 years of age (Vaillant, 2002).

The results for one of Vaillant's studies, the Grant Study of Harvard men, are shown in Figure 16.10. Note that when individuals at 50 years of age were not heavy smokers, did not abuse alcohol, had a stable marriage, exercised, maintained a normal weight, and had good coping skills, they were more likely to be alive and happy at 75 to 80 years of age.

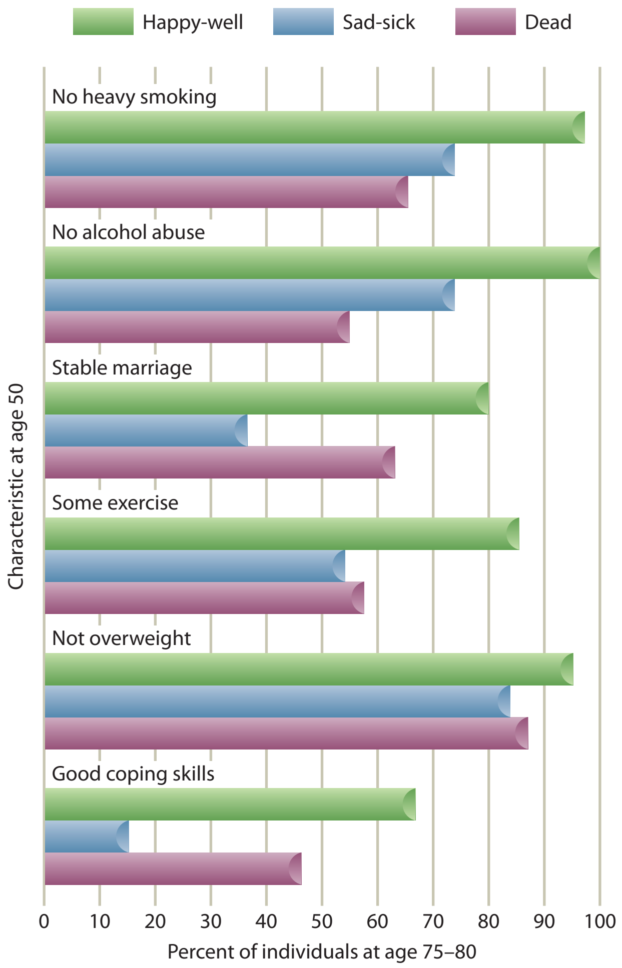


FIGURE **16.10**

LINKS BETWEEN CHARACTERISTICS AT AGE 50 AND HEALTH AND HAPPINESS AT AGE 75 TO 80. In a longitudinal study, the characteristics shown above at age 50 were related to whether individuals were happy-well, sad-sick, or dead at age 75 to 80 (Vaillant, 2002).

CONCLUSIONS

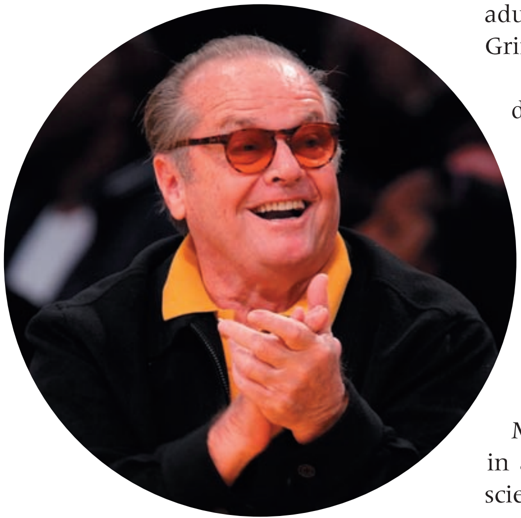
What can be concluded about stability and change in personality development during the adult years? According to a recent research review by leading researchers Brent Roberts and Daniel Mroczek (2008), there is increasing evidence that personality traits continue to change during the adult years, even into late adulthood. However, in the recent meta-analysis of 92 longitudinal studies described earlier, the greatest change in personality traits occurred in early adulthood—from about 20 to 40 years of age (Roberts, Walton, & Viechbauer, 2006).

Thus, people show more stability in their personality when they reach midlife than when they were younger adults. These findings support what is called a *cumulative personality model* of personality development, which states that with time and age people become more adept at interacting with their environment in ways that promote increased stability in personality (Caspi & Roberts, 2001).

This does not mean that change is absent throughout middle and late adulthood. Ample evidence shows that social contexts, new experiences, and sociohistorical changes can affect personality development, but the changes in middle and late

developmental **connection**

Life-Span Perspective. The extent to which development is characterized by stability and/or change is one of the life-span development's key issues. Chapter 1, p. 7



At age 55, actor Jack Nicholson said "I feel exactly the same as I've always felt: a slightly reined-in voracious beast." Nicholson felt his personality had not changed much. Some others might think they have changed more. *How much does personality change and how does it stay the same through adulthood?*

adulthood are usually not as great as those in early adulthood (Mroczek, Spiro, & Griffin, 2006).

In general, changes in personality traits across adulthood also occur in a positive direction. Over time, "people become more confident, warm, responsible, and calm" (Roberts & Mroczek, 2008, p. 33). Such positive changes equate with becoming more socially mature.

In sum, recent research contradicts the old view that stability in personality begins to set in at about 30 years of age (McAdams & Olson, 2010; Roberts & Mroczek, 2008; Roberts, Wood, & Caspi, 2008; Roberts & others, 2009). Although there are some consistent developmental changes in the personality traits of large numbers of people, at the individual level people can show unique patterns of personality traits—and these patterns often reflect life experiences related to themes of their particular developmental period (Roberts & Mroczek, 2008). For example, researchers have found that individuals who are in a stable marriage and a solid career track become more socially dominant, conscientious, and emotionally stable as they go through early adulthood (Roberts & Wood, 2006). And for some of these individuals there is greater change in their personality traits than for other individuals (McAdams & Olson, 2010; Roberts & Mroczek, 2008; Roberts & others, 2009).

Review *Connect* Reflect

LG2 Discuss stability and change in development during middle adulthood, including longitudinal studies.

Review

- Identify four longitudinal studies and describe their results.
- What conclusions can be reached about stability and change in development during middle adulthood?

Connect

- This section discussed four different longitudinal studies. What are the pros and cons to using a longitudinal study to collect data (as discussed in Chapter 1)?

Reflect *Your Own Personal Journey of Life*

- How much stability and change have characterized your life so far? How much stability and change do you predict will characterize your future development as an adult? Explain.

3 Close Relationships

LG3 Identify some important aspects of close relationships in middle adulthood.

- Love and Marriage at Midlife
- The Empty Nest and Its Refilling
- Sibling Relationships and Friendships
- Grandparenting
- Intergenerational Relationships

There is a consensus among middle-aged Americans that a major component of well-being involves positive relationships with others, especially parents, spouse, and offspring (Lachman, 2004; Markus & others, 2004). To begin our examination of midlife relationships, let's explore love and marriage in middle-aged adults.

LOVE AND MARRIAGE AT MIDLIFE

Remember from Chapter 14 that two major forms of love are romantic love and affectionate love. The fires of romantic love are strong in early adulthood. Affectionate, or companionate, love increases during middle adulthood. That is, physical attraction, romance, and passion are more important in new relationships, especially in early adulthood. Security, loyalty, and mutual emotional interest become more important as relationships mature, especially in middle adulthood.

A recent study revealed that marital satisfaction increased in middle age (Gorchoff, John, & Helson, 2008). Even some marriages that were difficult and rocky during early adulthood turn out to be better adjusted during middle adulthood. Although the partners may have lived through a great deal of turmoil, they eventually discover a deep and solid foundation on which to anchor their relationship. In middle adulthood, the partners may have fewer financial worries, less housework and chores, and more time with each other. Middle-aged partners are more likely to view their marriage as positive if they engage in mutual activities.

What characterizes marriage in middle adulthood?

Most individuals in midlife who are married voice considerable satisfaction with being married. In a large-scale study of individuals in middle adulthood, 72 percent of those who were married said their marriage was either "excellent" or "very good" (Brim, 1999). Possibly by middle age, many of the worst marriages already have dissolved. However, a recent study revealed that married and partnered middle-aged adults were more likely to view their relationships with ambivalence or indifference than their late adulthood counterparts (Windsor & Butterworth, 2010).

Divorce in middle adulthood may be more positive in some ways, more negative in others, than divorce in early adulthood. On the one hand, for mature individuals, the perils of divorce can be fewer and less intense than for younger individuals. They have more resources, and they can use this time as an opportunity to simplify their lives by disposing of possessions, such as a large home, which they no longer need. Their children are adults and may be able to cope with their parents' divorce more effectively. The partners may have gained a better understanding of themselves and may be searching for changes that could include the end to a poor marriage. One study found that women who initiated a divorce in midlife were characterized more by self-focused growth and optimism than were women whose husbands initiated the divorce (Sakraida, 2005).

On the other hand, the emotional and time commitment to marriage that has existed for so many years may not be lightly given up. Many midlife individuals perceive a divorce as failing in the best years of their lives. The divorcer might see the situation as an escape from an untenable relationship, but the divorced partner usually sees it as betrayal, the ending of a relationship that had been built up over many years and that involved a great deal of commitment and trust. Also, divorce may lower the economic standing of some middle-aged and older women who have a limited number of options (Mitchell, 2007). These women may lack the necessary education, skills, and employment experience that enable them to maintain a standard of living that is as high as when they were married. In sum, divorce in midlife may have positive outcomes for some individuals and negative outcomes for others (Pudrovska, 2009).

A survey by AARP (2004) of 1,148 40- to 79-year-olds who were divorced at least once in their forties, fifties, or sixties found that staying married because of their children was by far the main reason many people took so long to become divorced. Despite the worry and stress involved in going through a divorce, three in four of the divorcees said they had made the right decision to dissolve their marriage and reported a positive outlook on life. Sixty-six percent of the divorced women said they initiated the divorce compared with only 41 percent of the divorced men. The divorced women were much more afraid of having financial problems (44 percent) than the divorced men (11 percent). Following are the main reasons the middle-aged and older adult women cited for their divorce: (1) verbal, physical, or emotional abuse (23 percent); (2) alcohol or drug abuse (18 percent); and (3) cheating (17 percent). The main reasons the middle-aged and older men

What are some ways that divorce might be more positive or more negative in middle adulthood than in early adulthood?

cited for their divorce: (1) no obvious problems, just fell out of love (17 percent); (2) cheating (14 percent); and (3) different values, lifestyles (14 percent).

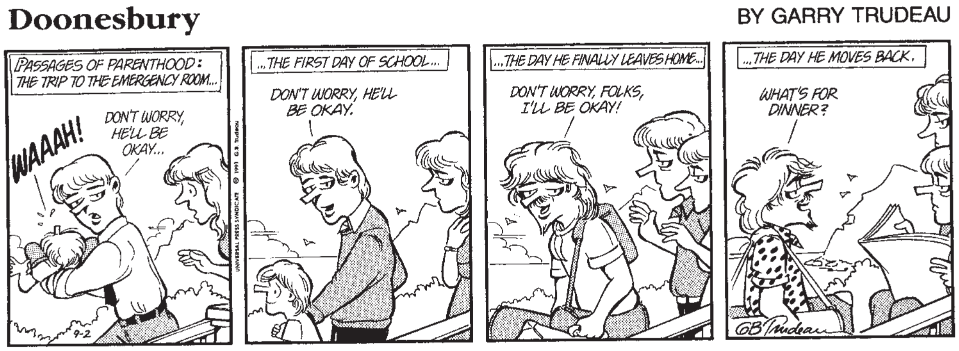
THE EMPTY NEST AND ITS REFILLING

An important event in a family is the launching of a child into adult life. Parents face new adjustments as a result of the child's absence. Students usually think that their parents suffer from their absence. In fact, parents who live vicariously through their children might experience the **empty nest syndrome,** which includes a decline in marital satisfaction after children leave the home. For most parents, however, marital satisfaction does not decline after children have left home but rather increases during the years after child rearing (Fingerman & Baker, 2006). With their children gone, marital partners have time to pursue career interests and more time for each other. A recent study revealed that the transition to an empty nest increased marital satisfaction and this increase was linked to an increase in the quality of time—but not the quantity of time—spent with partners (Gorschoff, John, & Helson, 2008).

In today's uncertain economic climate, the refilling of the empty nest is becoming a common occurrence as adult children return to live at home after several years of college, after graduating from college, or to save money after taking a full-time job (Merrill, 2009). Young adults also may move back in with their parents after an unsuccessful career or a divorce. And some individuals don't leave home at all until their middle to late twenties because they cannot financially support themselves. Numerous labels have been applied to these young adults who return to their parents' homes to live, including "boomerang kids," and "B2B" (or Back-to-Bedroom) (Furman, 2005).

The middle generation has always provided support for the younger generation, even after the nest is bare. Through loans and monetary gifts for education, and through emotional support, the middle generation has helped the younger generation. Adult children appreciate the financial and emotional support their parents provide them at a time when they often feel considerable stress about their career, work, and lifestyle. And parents feel good that they can provide this support. A recent study of 40- to 60-year-old parents revealed that they provided financial, practical, and emotional support on average every few weeks to each of their children over 18 years of age (Fingerman & others, 2009).

However, as with most family living arrangements, there are both pluses and minuses when adult children return to live at home. A common complaint voiced by both adult children and their parents is a loss of privacy. The adult children complain that their parents restrict their independence, cramp their sex lives, reduce their music listening, and treat them as children rather than adults. Parents often complain that their quiet home has become noisy, that they stay up late worrying when their adult children will come home, that meals are difficult to plan because of conflicting schedules, that their relationship as a married couple has been invaded, and that they have to shoulder too much responsibility for their adult children. In


Doonesbury
BY GARRY TRUDEAU
PASSAGES OF PARENTHOOD: THE TRIP TO THE EMERGENCY ROOM...
WAAAH!
DON'T WORRY, HE'LL BE OKAY...
...THE FIRST DAY OF SCHOOL...
DON'T WORRY, HE'LL BE OKAY.
...THE DAY HE FINALLY LEAVES HOME...
DON'T WORRY, FOLKS, I'LL BE OKAY!
...THE DAY HE MOVES BACK.
WHAT'S FOR DINNER?
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empty nest syndrome A decrease in marital satisfaction after children leave home, because parents derive considerable satisfaction from their children.

connecting development to life

Strategies for Parents and Their Young Adult Children

When adult children ask to return home to live, parents and their adult children should agree beforehand on the conditions and expectations. For example, they might discuss and agree on whether young adults will pay rent, wash their own clothes, cook their own meals, do any household chores, pay their phone bills, come and go as they please, be sexually active or drink alcohol at home, and so on. If these conditions aren't negotiated at the beginning, conflict often results because the expectations of parents and young adult children will likely be violated.

What are some strategies that can help parents and their young adult children get along better?

Parents need to treat young adult children more like adults than children and let go of much of their parenting role. Parents should interact with young adult children not as if they are dependent children who need to be closely monitored and protected but rather as adults who are capable of responsible, mature behavior. Adult children have the right to choose how much they sleep and eat, how they dress, whom they choose as friends and lovers, what career they pursue, and how they spend their money. However, if the young adult children act in ways that interfere with their parents' lifestyles, parents need to say so. The discussion should focus not on the young adult children's choices but on how their activities are unacceptable while living together in the same home.

Some parents don't let go of their young adult children when they should. They engage in "permaparenting," which can impede not only their adult children's movement toward independence and responsibility but also their own postparenting lives. "Helicopter parents" is another label used for parents who hover too closely in their effort to ensure that their children succeed in college and adult life (Paul, 2003). Although well intentioned, this intrusiveness by parents can slow the process by which their children become responsible adults.

When they move back home, young adult children need to think about how they will need to change their behavior to make the living arrangement work. Elina Furman (2005) provides some good recommendations in *Boomerang Nation: How to Survive Living with Your Parents . . . the Second Time Around.* She recommends that when young adult children move back home they expect to make adjustments. And as recommended earlier she urges young adults to sit down with their parents and negotiate the ground rules for living at home before they actually move back. Furman also recommends that young adults set a deadline for how long they will live at home and then stay focused on their goals (whether to save enough money to pay off their debts, save enough to start a business or buy their own home, finish graduate school, and so on). Too often young adults spend the money they save by moving home on such luxuries as spending binges, nights on the town, expensive clothes, and unnecessary travel, which only delay their ability to move out of their parents' home.

Children who leave college and return to live home with their parents are on the cusp of young adulthood, a time called emerging adulthood (as we learned in Chapter 12). What characterizes individuals' identity development during this time?

sum, when adult children return home to live, a disequilibrium in family life is created, which requires considerable adaptation on the part of parents and their adult children. To read about strategies that young adults and their parents can use to get along better, see *Connecting Development to Life*.

SIBLING RELATIONSHIPS AND FRIENDSHIPS

Sibling relationships persist over the entire life span for most adults (Dunn, 2007). Eighty-five percent of today's adults have at least one living sibling. Sibling relationships in adulthood may be extremely close, apathetic, or highly rivalrous (Bedford,

developmental **connection**

Family and Peers. Many siblings have mixed feelings about each other. Chapter 8, p. 259

2009). The majority of sibling relationships in adulthood are close (Cicirelli, 2009). Those siblings who are psychologically close to each other in adulthood tended to be that way in childhood. It is rare for sibling closeness to develop for the first time in adulthood (Dunn, 1984). A recent study revealed that adult siblings often provide practical and emotional support to each other (Voorpostel & Blieszner, 2008). Another recent study revealed that men who had poor sibling relationships in childhood were more likely to develop depression by age 50 than men who had more positive sibling relationships as children (Waldinger, Vaillant, & Orav, 2007).

Friendships continue to be important in middle adulthood just as they were in early adulthood (Antonucci, 1989). It takes time to develop intimate friendships, so friendships that have endured over the adult years are often deeper than those that have just been formed in middle adulthood.

GRANDPARENTING

The increase in longevity is influencing the nature of grandparenting (Szinovacz, 2009). In 1900 only 4 percent of 10-year-old children had four living grandparents but in 2000 that figure had risen to more than 40 percent. And in 1990 only about 20 percent of children at 30 years of age had living grandparents, a figure that is projected to increase to 80 percent in 2020 (Hagestad & Uhlenberg, 2007). Further increases in longevity are likely to support this trend in the future, although the current trend in delaying childbearing is likely to undermine it (Szinovacz, 2009).

Grandparents play important roles in the lives of many grandchildren (Oberlander, Black, & Starr, 2007). Many adults become grandparents for the first time during middle age. Researchers have consistently found that grandmothers have more contact with grandchildren than do grandfathers (Watson, Randolph, & Lyons, 2005). Perhaps women tend to define their role as grandmothers as part of their responsibility for maintaining ties between family members across generations. Men may have fewer expectations about the grandfather role and see it as more voluntary.

Grandparent Roles and Styles What is the meaning of the grandparent role? Three prominent meanings are attached to being a grandparent (Neugarten & Weinstein, 1964). For some older adults, being a grandparent is a source of biological reward and continuity. For others, being a grandparent is a source of emotional self-fulfillment, generating feelings of companionship and satisfaction that may have been missing in earlier adult-child relationships. And for yet others, being a grandparent is a remote role. A recent study revealed that grandparenting can provide a sense of purpose and a feeling of being valued during middle and late adulthood when generative needs are strong (Thiele & Whelan, 2008).

The grandparent role may have different functions in different families, in different ethnic groups and cultures, and in different situations (Watson, Randolph, & Lyons, 2005). For example, in one study of White, African American, and Mexican American grandparents and grandchildren, the Mexican American grandparents saw their grandchildren most frequently, provided the most support for the grandchildren and their parents, and had the most satisfying relationships with their grandchildren (Bengtson, 1985). And in a study of three generations of families in Chicago, grandmothers had closer relationships with their children and grandchildren and gave more personal advice than grandfathers did (Hagestad, 1985).

What are some grandparents' roles and styles?

The diversity of grandparenting also was apparent in an early investigation of how grandparents interacted with their grandchildren (Neugarten & Weinstein, 1964). Three styles were dominant—formal, fun-seeking, and distant. In the formal style, the grandparent performed what was considered to be a proper and prescribed role. These grandparents showed a strong interest in their grandchildren, but were careful not to give child-rearing advice. In the fun-seeking style, the grandparent was informal and playful. Grandchildren were a source of leisure activity; mutual satisfaction was emphasized. A substantial portion of grandparents were distant figures. In the distant-figure style, the grandparent was benevolent but interaction was infrequent. Grandparents who were over the age of 65 were more likely to display a formal style of interaction; those under 65 were more likely to display a fun-seeking style. Because the grandparent role links three generations—grandparents, parents, and grandchildren—the grandparent role is often mediated by parents at least until grandchildren become adults (Szinovacz, 2009).

The Changing Profile of Grandparents An increasing number of U.S. grandchildren live with their grandparents (Silverstein, 2009). In 1980, 2.3 million grandchildren lived with their grandparents, but in 2005 that figure had reached 6.1 million (U.S. Census Bureau, 2006). Divorce, adolescent pregnancies, and drug use by parents are the main reasons that grandparents are thrust back into the "parenting" role they thought they had shed. A recent study revealed that grandparent involvement was linked with better adjustment in single-parent and stepparent families than in two-parent biological families (Attar-Schwartz & others, 2009).

Less than 20 percent of grandparents whose grandchildren move in with them are 65 years old or older. Almost half of the grandchildren who move in with grandparents are raised by a single grandmother. These families are mainly African American (53 percent). When both grandparents are raising grandchildren, the families are overwhelmingly non-Latino White.

According to the 2006 U.S. Census report, a majority of the grandparents living with their children contributed to the family income and provided child care while parents worked. Only about 10 percent of the grandparents who move in with their children and grandchildren are in poverty. Almost half of the grandparents who move in with their children are immigrants. Partly because women live longer than men, more grandmothers than grandfathers live with their children. About 70 percent of the grandparents who move in with their children are grandmothers.

Grandparents who are full-time caregivers for grandchildren are at elevated risk for health problems, depression, and stress (Silverstein, 2009). Caring for grandchildren is linked with these problems in part because full-time grandparent caregivers are often characterized by low-income, minority status, and by not being married (Minkler & Fuller-Thompson, 2005). Grandparents who are part-time caregivers are less likely to have the negative health portrait that full-time grandparent caregivers have. In a recent study of part-time grandparent caregivers, few negative effects on grandparents were found (Hughes & others, 2007).

In some cases, divorce may increase children's contact with grandparents, as when grandparents assume a stronger caregiving role; in others, a custodial parent may try to restrict grandparents' time with children. One recent study revealed that when children's relationships with their father deteriorated after a divorce, their relationships with their paternal grandparents were distant, negative, or nonexistent (Ahrons, 2007).

As divorce and remarriage have become more common, a special concern of grandparents is visitation privileges with their grandchildren (Kivnik & Sinclair, 2007). In the last two decades, more states have passed laws giving grandparents the right to petition a court for visitation privileges with their grandchildren, even if a parent objects. Whether such forced visitation rights for grandparents are in the child's best interest is still being debated.

Middle-aged and older adults around the world show a strong sense of family responsibility. A recent study of middle-aged and older adults in 21 countries revealed the strongest intergenerational ties in Saudi Arabia.

INTERGENERATIONAL RELATIONSHIPS

Family is important to most people. When 21,000 adults aged 40 to 79 in 21 countries were asked, "When you think of who you are, you think mainly of ______," 63 percent said "family," 9 percent said "religion," and 8 percent said "work" (HSBC Insurance, 2007). In this study, in all 21 countries, middle-aged and older adults expressed a strong feeling of responsibility between generations in their family, with the strongest intergenerational ties indicated in Saudi Arabia, India, and Turkey. More than 80 percent of the middle-aged and older adults reported that adults have a duty to care for their parents (and parents-in-law) in time of need later in life.

Adults in midlife play important roles in the lives of the young and the old (Birditt & others, 2010; Ha & Ingersoll-Dayton, 2008; Fingerman & others, 2008, 2009). Middle-aged adults share their experience and transmit values to the younger generation (Swartz, 2008). They may be launching children and experiencing the empty nest, adjusting to having grown children return home, or becoming grandparents. They also may be giving or receiving financial assistance, caring for a widowed or sick parent, or adapting to being the oldest generation after both parents have died (Silverstein, Gans, & Yang, 2006).

developmental **connection**

Theories. In the convoy model of social relations, individuals go through life embedded in a personal network of individuals to whom they give and receive support. Chapter 19, p. 609

A valuable service that adult children can perform is to coordinate and monitor services for an aging parent who becomes disabled (Huyck, Ayalon, & Yoder, 2007). This might involve locating a nursing home and monitoring its quality, procuring medical services, arranging public service assistance, and handling finances. In some cases, adult children provide direct assistance with daily living, including such activities as eating, bathing, and dressing. Even less severely impaired older adults may need help with shopping, housework, transportation, home maintenance, and bill paying.

A recent study revealed that even when aging parents had health problems, they and their children generally described positive changes in their relationship in recent years (Fingerman & others, 2007). However, in most cases researchers have found that relationships between aging parents and their children are usually characterized by ambivalence (Birditt & others, 2010; Davey & others, 2009; Fingerman & others, 2008). Perceptions include love, reciprocal help, and shared values on the positive side and isolation, family conflicts and problems, abuse, neglect, and caregiver stress on the negative side.

With each new generation, personality characteristics, attitudes, and values are replicated or changed (Bengtson & Psouni, 2008). As older family members die, their biological, intellectual, emotional, and personal legacies are carried on in the next generation. Their children become the oldest generation and their grandchildren the second generation. As adult children become middle-aged, they often develop more positive perceptions of their parents (Field, 1999). In one study, conflicts between mothers and daughters decreased across the life course in both the United States and Japan (Akiyama & Antonucci, 1999).

In case you're worried about what's going to become of the younger generation, it's going to grow up and start worrying about the younger generation.

—Roger Allen

American Writer, 20th Century

For the most part, family members maintain considerable contact across generations (Miller-Day, 2004). However, a recent study found that married men and women have a lower incidence of intergenerational contact than never married or divorced individuals (Sarkisian & Gerstel, 2008). In this study, married adults were less likely to live with their parents, keep in touch, and give or receive emotional, financial, or practical help. Nonetheless, another recent study revealed that when young adults have children they are more likely to see their parents than if they don't have children (Bucx & others, 2008).

Both similarity and dissimilarity across generations are found. For example, similarity between parents and an adult child is most noticeable in religion and politics, least in gender roles, lifestyle, and work orientation.

What are the most common conflicts between parents and their adult children? In one study, they included communication and interaction style (such as "He is always yelling" and "She is too critical"), habits and lifestyle choices (such as sexual activity, living arrangements), child-rearing practices and values (such as decisions about having children, being permissive or controlling), politics, religion, and ideology (such as lack of religious involvement) (Clarke & others, 1999). In this study, there were generational differences in perceptions of the main conflicts between parents and adult children. Parents most often listed habits and lifestyle choices; adult children cited communication and interaction style.

The following studies provide further evidence of the importance of intergenerational relationships in development:

What is the nature of intergenerational relationships?

- In a New Zealand study of the child-rearing antecedents of intergenerational relations, supportive family environments and parenting in childhood (assessed when the children were 3 to 15 years of age) were linked with more positive relationships (in terms of contact, closeness, conflict, and reciprocal assistance) between the children and their middle-aged parents when the children were 26 years of age (Belsky & others, 2001).
- In another study, the motivation of adult children to provide social support to their older parents was linked with earlier family experiences (Silverstein & others, 2002). Children who spent more time in shared activities with their parents and were given more financial support by them earlier in their lives provided more support to their parents when they became older.
- In a recent study, adult children of divorce who were classified as securely attached were less likely to divorce in the early years of their marriage than their insecurely attached counterparts (Crowell, Treboux, & Brockmeyer, 2009).
- In a recent study, parents who smoked early and often, and persisted in becoming regular smokers, were more likely to have adolescents who became smokers (Chassin & others, 2008).

Gender differences also characterize intergenerational relationships (Etaugh & Bridges, 2010; Nauck & Suckow, 2006). Women have an especially important role in connecting family relationships across generations. Women's relationships across generations are thought to be closer than other family bonds (Merrill, 2009). In one study, mothers and their daughters had much closer relationships during their adult years than mothers and sons, fathers and daughters, and fathers and sons (Rossi, 1989). Also in this study, married men were more involved with their wives' kin than with their own. And maternal grandmothers and maternal aunts were cited twice as often as their counterparts on the paternal side of the family as the most important or loved relative. Also, a recent study revealed that mothers' intergenerational ties were more influential for grandparent-grandchild relationships than fathers' (Monserud, 2008). Although researchers have documented that mothers and daughters in adulthood generally have frequent contact and mutually positive feelings, little is known about what mothers and daughters like about their relationship. For instance, how do mothers' and daughters' descriptions of enjoyable visits differ at different points in adult development? To examine this topic further, see the following *Connecting Through Research*.

Middle-aged adults have been described as the "sandwich," "squeezed," or "overload" generation because of the responsibilities they have for their adolescent and young adult children on the one hand and their aging parents on the other (Etaugh & Bridges, 2010; Pudrovska, 2009). These simultaneous pressures from adolescents or young adult children and aging parents may contribute to stress in

connecting through research

How Do Mothers' and Daughters' Descriptions of Enjoyable Visits Differ at Different Points in Adult Development?

Karen Fingerman (2000) studied 48 pairs of older adult mothers (mean age, 76 years) and their middle-aged daughters (mean age, 46 years), and 44 pairs of middle-aged mothers (mean age, 47 years) and their young adult daughters (mean age, 21 years). Interviewers asked participants (p. 98):

> Think about the last time you had a particularly enjoyable visit with your daughter/mother. By visit, I mean a time when you got together, went to the other's house (or your daughter came home from college), or talked on the phone. Tell a little about what went on. Please provide as much information as you can about the visit, what happened, and why it was particularly enjoyable.

Transcriptions of the visits were coded, and the results for the coded categories were as follows (Fingerman, 2000, pp. 100–102):

- *Investment and connection.* Mothers in both age groups were more invested in their relationship with their daughters than their daughters were with them.
- *Family.* Older mothers and daughters were more likely than younger pairs to describe the larger kin network, such as the daughter's children, siblings, father, husband, or the family in general. By contrast, younger pairs "were more likely to stick to their own relationship and to discuss situations in which the two of them had enjoyed a special event."
- *Nurturance.* "Young adult daughters and older adult mothers were more likely to report pleasure from having the other party help them in some way than were middle-aged women."
- *Interacting.* Younger mothers tended to focus on activities in which they enjoyed their daughters' emergence as young adults. "Younger daughters derived pleasure from having their mothers around as sounding boards, whereas older daughters" enjoyed the link to the past that their mothers represented.
- *Negative comments.* Mothers and daughters in the older pairs "were more likely to say something negative than were younger mothers and daughters," although these comments were still infrequent.

In sum, mothers' and daughters' perceptions of their visits reflected a combination of individual developmental needs. Although the focus of mothers' and daughters' relationships may change, in general mothers were more invested in their daughters than the reverse throughout adulthood.

middle adulthood. Many middle-aged adults experience considerable stress when their parents become very ill and die. One survey found that when adults enter midlife, 41 percent have both parents alive but that 77 percent leave midlife with no parents alive (Bumpass & Aquilino, 1994).

When adults immigrate to another country, intergenerational stress may be increased. In the last several decades, increasing numbers of Mexicans have immigrated to the United States, and their numbers are expected to increase. The pattern of immigration usually involves separation from the extended family (Parra-Cardona & others, 2006). It may also involve separation of immediate family members, with the husband coming first and then later bringing his wife and children. Those initially isolated, especially the wife, experience considerable stress due to relocation and the absence of family and friends. Within several years, a social network is usually established in the ethnic neighborhood.

As soon as some stability in their lives is achieved, Mexican families may sponsor the immigration of extended family members, such as a maternal or paternal sister or mother who provides child care and enables the mother to go to work. In some cases, the older generation remains behind and joins their grown children in old age. The accessibility of Mexico facilitates visits to and from the village for vacations or at a time of crisis, such as when an adolescent runs away from home.

The discrepancies between acculturation levels can give rise to conflicting expectations within the Mexican American family (Sarkisian, Gerena, & Gerstel, 2006). The immigrant parents' model of child rearing may be out of phase with the dominant culture's model, which may cause reverberations through the family's generations, as we discussed in earlier chapters. For example, the mother and

connecting with careers

Lillian Troll, Professor of Psychology and Life-Span Development and Researcher on Families and Aging Women

Lillian Troll has been a leading figure in the field of adult development and aging. She graduated from the University of Chicago with a joint major in psychology and premedicine. During World War II, she dropped out of graduate school to work in Washington, where she helped develop an array of Army screening and achievement tests. After the war she became a suburban housewife and mother, following her husband's career moves from city to city. For a decade, the closest Troll came to a career in life-span development was founding a nursery school in New Jersey.

Many years later, after her divorce, Troll returned to the University of Chicago and in 1967 completed a Ph.D. in life-span development. She then began teaching and conducting research on generations in the family and women's development, first at Wayne State University in Detroit and then as a 60-year-old grandmother at Rutgers University Psychology Department. In 1986 she retired and moved to California, where she continued research at the University of California at San Francisco, by collaborating with Colleen Johnson on a longitudinal study of the "oldest-old" (people over 85).

Lillian Troll (*left*) with participants in a study of aging women.

For more information about what professors and researchers do, see page 45 in the Careers in Life-Span Development appendix.

How might acculturation influence intergenerational relations in Mexican American families?

grandparents may be especially resistant to the demands for autonomy and dating made by adolescent daughters, and so may the father (Wilkinson-Lee & others, 2006). And in recent years an increasing number of female youth have left their Mexican American homes to further their education, an event that is often stressful for families with strong ties to Mexican values.

Lillian Troll has conducted research on intergenerational relations and women's development in midlife. To read about her work, see *Connecting With Careers*.

Review Connect Reflect

LG3 Identify some important aspects of close relationships in middle adulthood.

Review

- How can love and marriage at midlife be characterized?
- What is the empty nest? How has it been refilling?
- What are sibling relationships and friendships like in middle adulthood?
- What is the nature of grandparenting?
- What are relationships across generations like?

Connect

- In this section, you read about divorce in middle adulthood. In Chapter 14, what did you learn was one of the most common characteristics of divorced adults?

Reflect *Your Own Personal Journey of Life*

- What was or is the nature of your relationship with your grandparents? What are the intergenerational relationships like in your family?

topical **connections**

Erikison's eighth and final stage of development—integrity versus despair—occurs in late adulthood. In this stage, individuals engage in a life review. Being active is linked with life satisfaction in late adulthood. Older adults become more selective about their social networks and choose to spend more time with emotionally rewarding relationships and less time with peripheral relationships. Older adults also experience more positive emotions and fewer negative emotions than younger adults. The personality traits of conscientiousness and agreeableness also increase in late adulthood. Because of losses (declines in physical or cognitive skills, for example), older adults often have to use accommodative strategies to reach their goals.

looking ***forward***

reach your **learning goals**

Socioemotional Development in Middle Adulthood

1 Personality Theories and Development

LG1 Describe personality theories and development in middle adulthood.

Stages of Adulthood

- Erikson says that the seventh stage of the human life span, generativity versus stagnation, occurs in middle adulthood. Four types of generativity are biological, parental, work, and cultural. In Levinson's theory, developmental tasks must be mastered at different points in development, and changes in middle age focus on four conflicts: being young versus being old, being destructive versus being constructive, being masculine versus being feminine, and being attached to others versus being separated from them. Levinson proposed that a majority of Americans, especially men, experience a midlife crisis. Research, however, indicates that midlife crises are not pervasive. There is considerable individual variation in development during the middle adulthood years.

The Life-Events Approach

- According to the early version of the life-events approach, life events produce taxing circumstances that create stress in people's lives. In the contemporary version of the life-events approach, how life events influence the individual's development depends not only on the life event but also on mediating factors, adaptation to the event, the life-stage context, and the sociohistorical context.

Stress and Personal Control in Midlife

- Researchers have found that young and middle-aged adults experience more stressful days and more multiple stressors than do older adults. On average, a sense of personal control decreases as adults become older—however, some aspects of personal control increase.

Contexts of Midlife Development

- Neugarten argues that the social environment of a particular cohort can alter its social clock—the timetable according to which individuals are expected to accomplish life's tasks. Critics say that the adult stage theories are male biased because they place too much emphasis on achievement and careers and do not adequately address women's concerns about relationships. Midlife is a heterogeneous period for women, as it is for men. For some women, midlife is the prime of their lives. Many cultures do not have a clear concept of middle age. In many nonindustrialized societies, a woman's status improves in middle age.

2 Stability and Change

LG2 Discuss stability and change in development during middle adulthood, including longitudinal studies.

Longitudinal Studies

- In Costa and McCrae's Baltimore Study, the Big Five personality factors—openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism—showed considerable stability. However, a recent meta-analysis of the Big Five personality factors found increases and declines of specific factors across the adult years, with the most change occurring in early adulthood. In the Berkeley Longitudinal Studies, the extremes in the stability-change argument were not supported. The most stable characteristics were intellectual orientation, self-confidence, and openness to new experiences. The characteristics that changed the most were nurturance, hostility, and self-control. The Helson's Mills College Study of women distinguished family-oriented and career-oriented women, and those who followed neither path. In their early forties, women experienced many of the concerns that Levinson described for men. However, rather than a midlife crisis, women experienced midlife consciousness. George Vaillant's research revealed links between a number of characteristics at age 50 and health and well-being at 75 to 80 years of age.

Conclusions

- The cumulative personality model states that with time and age personality becomes more stable. Change in personality traits occurs more in early adulthood than middle and late adulthood, but a number of aspects of personality do continue to change after early adulthood. Change in personality traits across adulthood occurs in a positive direction, reflecting social maturity. At the individual level, changes in personality are often linked to life experiences related to a particular developmental period. Some people change more than others.

3 Close Relationships

LG3 Identify some important aspects of close relationships in middle adulthood.

Love and Marriage at Midlife

- Affectionate love increases in midlife, especially in marriages that have endured many years. A majority of middle-aged adults who are married say that their marriage is very good or excellent. Researchers recently have found that the perils of divorce in midlife can be few and less intense than those for divorcing young adults.

The Empty Nest and Its Refilling

- Rather than decreasing marital satisfaction as once thought, the empty nest increases it for most parents. Following an unsuccessful career or a divorce, an increasing number of young adults are returning home to live with their parents. Some young adults do not leave home until their middle to late twenties because they are unable to financially support themselves.

Sibling Relationships and Friendships

- Sibling relationships continue throughout life. Some are close; others are distant. Friendships continue to be important in middle age.

Grandparenting

- There are different grandparent roles and styles. Grandmothers spend more time with grandchildren than grandfathers, and the grandmother role involves greater expectations for maintaining ties across generations than the grandfather role. The profile of grandparents is changing because of such factors as divorce and remarriage. An increasing number of U.S. grandchildren live with their grandparents.

Intergenerational Relationships

- Family members usually maintain contact across generations. Mothers and daughters have the closest relationships. The middle-aged generation, which has been called the “sandwich” or “squeezed” generation, plays an important role in linking generations.

key **terms**

contemporary life-events approach 507
social clock 508
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empty nest syndrome 516

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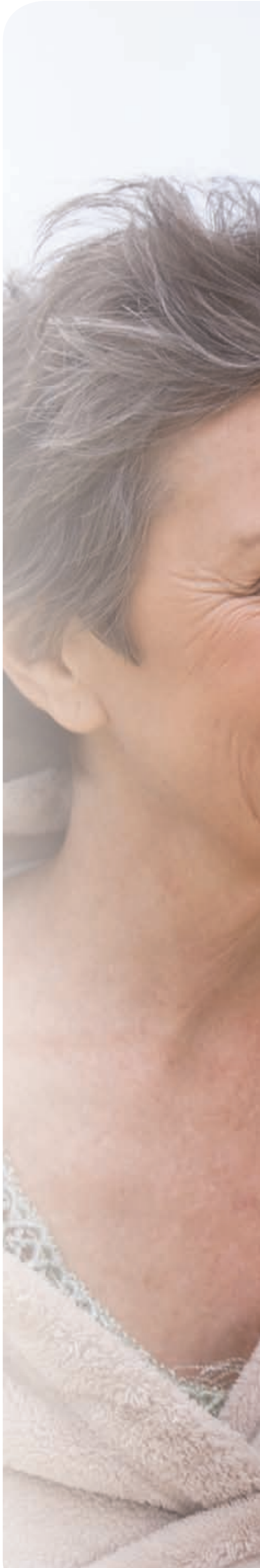
section **nine**

To be seventy years young is sometimes far more cheerful and hopeful than to be forty years old.

—OLIVER WENDELL HOLMES, SR.
American Physician, 19th Century

Late Adulthood

The rhythm and meaning of human development eventually wend their way to late adulthood, when each of us stands alone at the heart of the earth and suddenly it is evening. We shed the leaves of youth and are stripped by the winds of time down to the truth. We learn that life is lived forward but understood backward. We trace the connection between the end and the beginning of life and try to figure out what this whole show is about before it is out. Ultimately, we come to know that we are what survives of us. Section 9 contains three chapters: "Physical Development in Late Adulthood (Chapter 17), "Cognitive Development in Late Adulthood" (Chapter 18), and "Socioemotional Development in Late Adulthood" (Chapter 19).



chapter 17 PHYSICAL DEVELOPMENT IN LATE ADULTHOOD

chapter **outline**

1 Longevity

Learning Goal 1 Characterize longevity and the biological theories of aging.

Life Expectancy and Life Span
The Young-Old, the Old-Old, and the Oldest-Old
Biological Theories of Aging

2 The Course of Physical Development in Late Adulthood

Learning Goal 2 Describe how a person's brain and body change in late adulthood.

The Aging Brain
The Immune System
Physical Appearance and Movement
Sensory Development
The Circulatory System and Lungs
Sexuality

3 Health

Learning Goal 3 Identify health problems in older adults and how they can be treated.

Health Problems
Substance Use and Abuse
Exercise, Nutrition, and Weight
Health Treatment

Jonathan Swift said, "No wise man ever wished to be younger." Without a doubt, a 70-year-old body does not work as well as it once did. It is also true that an individual's fear of aging is often greater than need be. As more individuals live to a ripe *and* active old age, our image of aging is changing. While on average a 75-year-old's joints should be stiffening, people can practice not to be average. For example, a 75-year-old man might *choose* to train for and run a marathon; an 80-year-old woman whose capacity for work is undiminished might *choose* to make and sell children's toys.

Consider 85-year-old Sadie Halperin, who has been working out for 11 months at a rehabilitation center for the aged in Boston. She lifts weights and rides a stationary bike. She says that before she started working out, about everything she did—shopping, cooking, walking—was a major struggle. Sadie says she always felt wobbly and held on to a wall when she walked. Now she walks down the center of the hallways and reports that she feels wonderful. Initially she could lift only 15 pounds with both legs; now she lifts 30 pounds. At first she could bench-press only 20 pounds; now she bench-presses 50 pounds. Sadie's exercise routine has increased her muscle strength and helps her to battle osteoporosis by slowing the calcium loss from her bones, which can lead to deadly fractures (Ubell, 1992).

Eighty-five-year-old Sadie Halperin engaging in her exercise routine.

topical **connections**

As more individuals are living healthier lives and medical discoveries are slowing down the aging process, middle age appears to be starting later and lasting longer. Increasingly, early middle age (40–54) is distinguished from late middle age (55–65). However, middle age is a time of declining physical skills—such as loss of height, decline in vision and hearing, and cardiovascular decline. Sleep also becomes more problematic. Sexual changes occur as women enter menopause, many middle-aged men begin to experience erectile dysfunction, and couples engage less frequently in sexual intercourse.

looking ***back***

preview

The story of Sadie Halperin's physical development and well-being raises some truly fascinating questions about life-span development, which we will explore in this chapter. They include: Why do we age, and what, if anything, can we do to slow down the process? How long can we live? What chance do we have of living to be 100? How does the body change in old age? Can certain eating habits and exercise help us live longer? How can we enhance older adults' quality of life?

1 Longevity

LG1 Characterize longevity and the biological theories of aging.

Life Expectancy and Life Span

The Young-Old, the Old-Old, and the Oldest-Old

Biological Theories of Aging

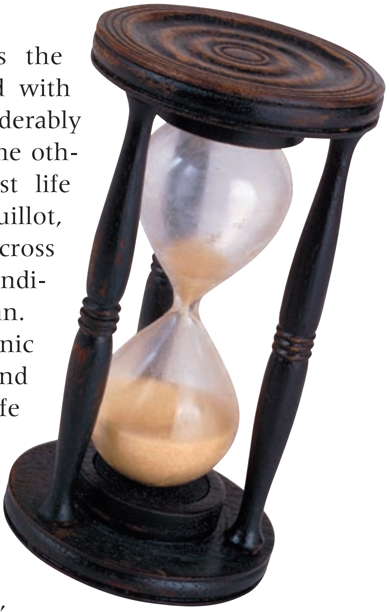
In his eighties, Nobel-winning chemist Linus Pauling argued that vitamin C slows the aging process. Aging researcher Roy Walford fasted two days a week because he believed calorie restriction slows the aging process. What do we really know about longevity?

LIFE EXPECTANCY AND LIFE SPAN

We are no longer a youthful society. The proportion of individuals at different ages has become increasingly similar. Since the beginning of recorded history, **life span,** the maximum number of years an individual can live, has remained at approximately 120 to 125 years of age. But since 1900, improvements in medicine, nutrition, exercise, and lifestyle have increased our life expectancy an average of 30 additional years.

Recall from Chapter 1 that **life expectancy** is the number of years that the average person born in a particular year will probably live. Sixty-five-year-olds in the United States today can expect to live an average of 18 more years (20 for females, 16 for males) (National Center for Health Statistics, 2006). The average life expectancy of individuals born today in the United States is 78 years (National Center for Health Statistics, 2010d).

> Each of us stands alone at
> the heart of the earth, pierced
> through by a ray of sunshine:
> And suddenly it is evening.
>
> —Salvatore Quasimodo
> *Italian Poet, 20th Century*



Differences in Life Expectancy How does the United States fare in life expectancy, compared with other countries around the world? We do considerably better than some, and a little worse than some others (Powell, 2009). Japan has the highest life expectancy at birth today (82 years) (Guillot, 2009). Differences in life expectancies across countries are due to such factors as health conditions and medical care throughout the life span.

Life expectancy also differs for various ethnic groups within the United States and for men and women (Guillot, 2009). For example, the life expectancy of African Americans (73) in the United States is five years lower than the life expectancy for non-Latino Whites (78) (National Center for Health Statistics, 2010d). Non-Latino White women have a life expectancy of 81, followed by African American women (77),

> To me old age is always
> fifteen years older than I am.
>
> —Bernard Baruch
> *American Statesman, 20th Century*

life span The upper boundary of life, the maximum number of years an individual can live. The maximum life span of human beings is about 120 to 125 years of age.

life expectancy The number of years that will probably be lived by the average person born in a particular year.

non-Latino White men (76 years), and African American men (70 years) (National Center for Health Statistics, 2010d).

Today, the overall life expectancy for women is 80.7 years of age, and for men it is 75.4 years of age (National Center for Health Statistics, 2010d). Beginning in the mid-thirties, women outnumber men; this gap widens during the remainder of the adult years. By the time adults are 75 years of age, more than 61 percent of the population is female; for those 85 and over, the figure is almost 70 percent female. Why can women expect to live longer than men? Social factors such as health attitudes, habits, lifestyles, and occupation are probably important (Saint Onge, 2009). For example, men are more likely than women to die from the leading causes of death in the United States, such as cancer of the respiratory system, motor vehicle accidents, cirrhosis of the liver, emphysema, and coronary heart disease (Yoshida & others, 2006). These causes of death are associated with lifestyle. For example, the sex difference in deaths due to lung cancer and emphysema occurs because men are heavier smokers than women.

The sex difference in longevity also is influenced by biological factors (Guillot, 2009; Oksuzyan & others, 2008). In virtually all species, females outlive males. Women have more resistance to infections and degenerative diseases (Candore & others, 2006). For example, the female's estrogen production helps to protect her from arteriosclerosis (hardening of the arteries). And the additional X chromosome that women carry in comparison to men may be associated with the production of more antibodies to fight off disease.

What about yourself? What is the likelihood that you will live to be 100? To evaluate this possibility, see Figure 17.1 on page 534.

developmental **connection**

Life Expectancy. In the 20th century alone, life expectancy in the United States increased 30 years. Chapter 1, p. 7

Centenarians In industrialized countries, the number of centenarians (individuals 100 years and older) is increasing at a rate of approximately 7 percent each year (Perls, 2007). In the United States, there were only 15,000 centenarians in 1980, a number that rose to 55,000 in 2008, and it is projected that this number will reach more than 800,000 by 2050. The United States has the most centenarians followed by Japan, China, and England/Wales (Hall, 2008). It is estimated that there are 75 to 100 supercentenarians (individuals 110 years or older) in the United States and about 300 to 450 worldwide (Perls, 2007).

Many people expect that "the older you get, the sicker you get." However, researchers are finding that is not true for some centenarians (Kutner, 2009). One study of 93 centenarians revealed that despite some physical limitations, they had a low rate of age-associated diseases and most had good mental health (Selim & others, 2005).

18
BALLOT
BOX

Three participants in the New England Centenarian Study: (*Left*) Adelaide Kruger, age 101, watering her flowers; (*middle*) Waldo McBurney, age 104, active beekeeper, gardener, and runner who has earned five gold medals and set international records in track and field events in his age group; (*right*) Daphne Brann, age 110, voting in an election.

This test gives you a rough guide for predicting your longevity. The basic life expectancy for men is age 75, and for women it is 81. Write down your basic life expectancy. If you are in your fifties or sixties, you should add ten years to the basic figure because you have already proved yourself to be a durable individual. If you are over age 60 and active, you can even add another two years.

Life Expectancy

Decide how each item applies to you and add or subtract the appropriate number of years from your basic life expectancy.

1. Family history
___ Add five years if two or more of your grandparents lived to 80 or beyond.
___ Subtract four years if any parent, grandparent, sister, or brother died of a heart attack or stroke before 50.
___ Subtract two years if anyone died from these diseases before 60.
___ Subtract three years for each case of diabetes, thyroid disorder, breast cancer, cancer of the digestive system, asthma, or chronic bronchitis among parents or grandparents.

2. Marital status
___ If you are married, add four years.
___ If you are over 25 and not married, subtract one year for every unmarried decade.

3. Economic status
___ Add two years if your family income is over $60,000 per year.
___ Subtract three years if you have been poor for the greater part of your life.

4. Physique
___ Subtract one year for every 10 pounds you are overweight.
___ For each inch your girth measurement exceeds your chest measurement deduct two years.
___ Add three years if you are over 40 and not overweight.

5. Exercise
___ Add three years if you exercise regularly and moderately (jogging three times a week).
___ Add five years if you exercise regularly and vigorously (long-distance running three times a week).
___ Subtract three years if your job is sedentary.
___ Add three years if your job is active.

6. Alcohol
___ Add two years if you are a light drinker (one to three drinks a day).
___ Subtract five to ten years if you are a heavy drinker (more than four drinks per day).
___ Subtract one year if you are a teetotaler.

7. Smoking
___ Subtract eight years if you smoke two or more packs of cigarettes per day.
___ Subtract two years if you smoke one to two packs per day.
___ Subtract two years if you smoke less than one pack.
___ Subtract two years if you regularly smoke a pipe or cigars.

8. Disposition
___ Add two years if you are a reasoned, practical person.
___ Subtract two years if you are aggressive, intense, and competitive.
___ Add one to five years if you are basically happy and content with life.
___ Subtract one to five years if you are often unhappy, worried, and often feel guilty.

9. Education
___ Subtract two years if you have less than a high school education.
___ Add one year if you attended four years of school beyond high school.
___ Add three years if you attended five or more years beyond high school.

10. Environment
___ Add four years if you have lived most of your life in a rural environment.
___ Subtract two years if you have lived most of your life in an urban environment.

11. Sleep
___ Subtract five years if you sleep more than nine hours a day.

12. Temperature
___ Add two years if your home's thermostat is set at no more than 68˚ F.

13. Health care
___ Add three years if you have regular medical checkups and regular dental care.
___ Subtract two years if you are frequently ill.

___ **Your Life Expectancy Total**

FIGURE **17.1**
CAN YOU LIVE TO BE 100?

In the ongoing New England Centenarian Study, a majority of the centenarians have had difficult lives, such as surviving the Holocaust and living in extreme poverty as an immigrant to the United States (Perls, Lauerman, & Silver, 1999). What has contributed to their survival is their ability to cope successfully with stress.

What chance do you have of living to be 100? Genes play an important role in surviving to an extreme old age (Bostock, Soiza, & Whalley, 2009). As we saw in Chapter 2, "Biological Beginnings," the search for longevity genes has recently intensified (Concannon & others, 2009; Hinks & others, 2009). But there are also other factors at work such as family history, health (weight, diet, smoking, and exercise), education, personality, and lifestyle (Barbieri & others, 2009). To further examine the factors that are involved in living to a very old age, let's journey to the island of Okinawa in the East China Sea where individuals live longer than anywhere else in the world. In Okinawa, there are 34.7 centenarians for every 100,000 inhabitants, the highest ratio in the world. In comparison, the United

developmental **connection**

Nature vs. Nurture. The nature-nurture issue is a key aspect of understanding development throughout the human life span. Chapter 1, p. 20; Chapter 2, p. 75

States has about 10 centenarians for every 100,000 residents. The life expectancy in Okinawa is 81.2 years (86 for women, 78 for men), also highest in the world.

What is responsible for such longevity in Okinawa? Some possible explanations include (Willcox, Willcox, & Suzuki, 2002; Willcox & others, 2007, 2008):

- *Diet.* Okinawans eat very healthy food, heavy on grains, fish, and vegetables, light on meat, eggs, and dairy products. The risk of dying of cancer is far lower among Okinawans than among Japanese and Americans (see Figure 17.2). About 100,000 Okinawans moved to Brazil and quickly adopted the eating regimen of their new home, one heavy on red meat. The result: The life expectancy of the Brazilian Okinawans is now 17 years lower than Okinawa's 81 years!
- *Low-stress lifestyle.* The easygoing lifestyle in Okinawa more closely resembles that of a laid-back South Sea island than that of the high-stress world on the Japanese mainland.
- *Caring community.* Okinawans look out for each other and do not isolate or ignore their older adults. If older adults need help, they don't hesitate to ask a neighbor. Such support and caring is likely responsible for Okinawa having the lowest suicide rate among older women in East Asia, an area noted for its high suicide rate among older women.
- *Activity.* Many older adults in Okinawa are active, engaging in such activities as taking walks and working in their gardens. Many older Okinawans also continue working at their jobs.
- *Spirituality.* Many older adults in Okinawa find a sense of purpose in spiritual matters. Prayer is commonplace and believed to ease the mind of stress and problems.

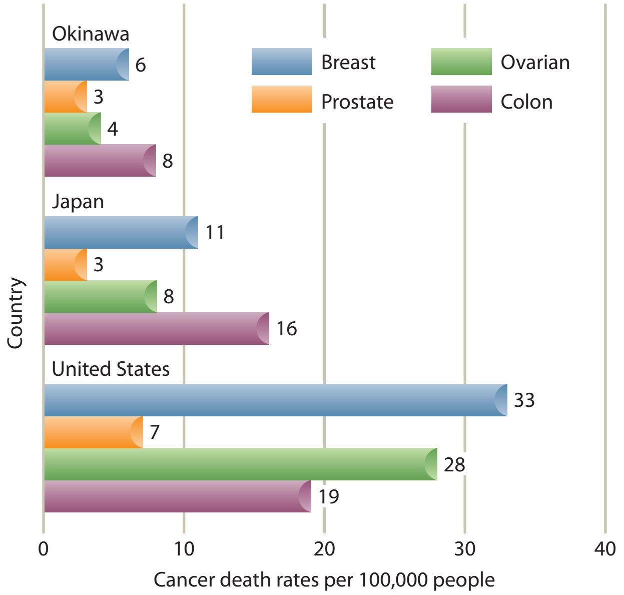


FIGURE **17.2**

RISKS OF DYING FROM CANCER IN OKINAWA, JAPAN, AND THE UNITED STATES. The risk of dying from different forms of cancer is lower in Okinawa than in the United States and Japan (Willcox, Willcox, & Suzuki, 2002). Okinawans eat lots of tofu and soy products, which are rich in flavonoids (believed to lower the risk of breast and prostate cancer). They also consume large amounts of fish, especially tuna, mackerel, and salmon, which reduce the risk of breast cancer.

THE YOUNG-OLD, THE OLD-OLD, AND THE OLDEST-OLD

Do you want to live to be 100, or 90? As we discussed in Chapter 1, these ages are part of late adulthood, which begins in the sixties and extends to approximately 120 to 125 years of age. This is the longest span of any period of human development—50 to 60 years. Some developmentalists distinguish between the *young-old* (65 to 74 years of age) and the *old-old*, or *old age* (75 years and older) (Charness & Bosman, 1992). Yet others distinguish the *oldest-old* (85 years and older) from younger older adults (65 to 84 years age) (Dunkle, 2009).

An increased interest in successful aging is producing a portrayal of the oldest-old that is more optimistic than past stereotypes (Dunkle, 2009; Vasunilashorn & Crimmins, 2009). Interventions such as cataract surgery and a variety of rehabilitation strategies are improving the functioning of the oldest-old. And there is cause for optimism in the development of new regimens of prevention and intervention, such as engaging in regular exercise (Erickson & others, 2009).

Many experts on aging prefer to talk about such categories as the young-old, old-old, and oldest-old in terms of *function* rather than age. Remember from Chapter 1 that we described age not only in terms of chronological age, but also in terms of biological age, psychological age, and social age. Thus, in terms of *functional age*—the person's actual ability to function—an 85-year-old might well be more biologically and psychologically fit than a 65-year-old.

Still, there are some significant differences between adults in their sixties or seventies and adults who are 85 and older (Dunkle, 2009). As we discussed in

Teru Kingjo, 88, who continues to work as a weaver on Okinawa Island, Japan. She, like many Okinawans, believes that such sense of purpose helps people to live longer.

(a) (b)

(*a*) Frenchwoman Jeanne Louise Calment, who recently died at the age of 122. Greater ages have been claimed, but scientists say the maximum human life span is about 120 to 125. (*b*) Heredity is an important component of how long we will live. For example, in Figure 17.1, you were able to add five years to your life expectancy if two or more of your grandparents lived to 80 or beyond. And if you were born a female, you start out with a basic life expectancy that is six years more than if you were born a male. The three sisters shown here, all in their eighties, are celebrating the youngest sister's (*center*) 80th birthday.

Chapter 1, Paul Baltes and his colleagues (Baltes, 2003; Scheibe, Freund, & Baltes, 2007) argue that the oldest-old (85 and over) face a number of problems, including sizable losses in cognitive potential and ability to learn; an increase in chronic stress; a sizable prevalence of physical and mental disabilities; high levels of frailty; increased loneliness; and the difficulty of dying at older ages with dignity. He contrasts the problems of the oldest-old with the increase in successful aging of adults in their sixties and seventies. Compared with the oldest-old, the young-old have a substantial potential for physical and cognitive fitness, higher levels of emotional well-being, and more effective strategies for mastering the gains and losses of old age.

The oldest-old today are mostly female, and the majority of these women are widowed and live alone, if not institutionalized. The majority also are hospitalized at some time in the last years of life, and the majority die alone in a hospital or institution. Their needs, capacities, and resources are often different from those of older adults in their sixties and seventies (Scheibe, Freund, & Baltes, 2007).

Despite the negative portrait of the oldest-old by Baltes and his colleagues, they are a heterogeneous, diversified group. In the New England Centenarian Study, 15 percent of the individuals 100 years and older were living independently at home, 35 percent with a family or in assisted living, and 50 percent in nursing homes (Perls, 2007).

A significant number of the oldest-old have cognitive impairments, but many do not. Almost one-fourth of the oldest-old are institutionalized, and many report some limitation of activity or difficulties in caring for themselves. However, more than three-fourths are not institutionalized. The majority of older adults aged 80 and over continue to live in the community. More than one-third of older adults 80 and over who live in the community report that their health is excellent or good; 40 percent say that they have no activity limitation (Suzman & others, 1992). Less than 50 percent of U.S. 85- to 89-year-olds have a disability (Siegler, Bosworth, & Poon, 2003); a substantial subgroup of the oldest-old are robust and active. The oldest-old who have aged successfully have often been unnoticed and unstudied.

BIOLOGICAL THEORIES OF AGING

Even if we stay remarkably healthy, we begin to age at some point. In fact, some life-span experts argue that biological aging begins at birth (Schaie, 2000). What are the biological explanations of aging? Intriguing explanations of why we age are provided by five biological theories: evolutionary, cellular clock theory, free-radical theory, mitochondrial theory, and hormonal stress theory.

Evolutionary Theory Recall from Chapter 2 the view that the benefits conferred by evolutionary selection decrease with age (Baltes, 2003). In the **evolutionary theory of aging,** natural selection has not eliminated many harmful conditions and nonadaptive characteristics in older adults (Austad, 2009). Why? Because natural selection is linked to reproductive fitness, which only is present in the earlier part of adulthood. For example, consider Alzheimer disease, an irreversible brain disorder, which does not appear until the late middle adulthood or late adulthood years. In evolutionary theory, if Alzheimer disease occurred earlier in development, it may have been eliminated many centuries ago.

Cellular Clock Theory **Cellular clock theory** is Leonard Hayflick's (1977) theory that cells can divide a maximum of about 75 to 80 times, and that as we age our cells become less capable of dividing. Hayflick found that cells extracted from adults in their fifties to seventies divided fewer than 75 to 80 times. Based on the ways cells divide, Hayflick places the upper limit of the human life-span potential at about 120 to 125 years of age.

In the last decade, scientists have tried to fill in a gap in cellular clock theory (Liew & Norbury, 2009; Sahin & DePinho, 2010; Zou & others, 2009). Hayflick did not know why cells die. The answer may lie at the tips of chromosomes, at *telomeres,* which are DNA sequences that cap chromosomes (Davoli, Denchi, & de Lange, 2010; Osterhage & Friedman, 2009). Each time a cell divides, the telomeres become shorter and shorter (see Figure 17.3). After about 70 or 80 replications, the telomeres are dramatically reduced, and the cell no longer can reproduce. A recent study revealed that healthy centenarians had longer telomeres than unhealthy centenarians (Terry & others, 2008). Another recent study found that women with higher intakes of vitamins C and E had longer telomeres than women with lower intakes of these vitamins (Xu & others, 2009).

Injecting the enzyme *telomerase* into human cells grown in the laboratory has been found to substantially extend the life of the cells beyond the approximately 70 to 80 normal cell divisions (Aubert & Lansdorp, 2008). However, telomerase is present in approximately 85 percent of cancerous cells and thus may not produce healthy life extension of cells (Fakhoury, Nimmo, & Autexier, 2007). To capitalize on the high presence of telomerase in cancerous cells, researchers currently are investigating gene therapies that inhibit telomerase and lead to the death of cancerous cells while keeping healthy cells alive (Effros, 2009a; Skordalakes, 2009; Wu & others, 2009).

Free-Radical Theory A second microbiological theory of aging is **free-radical theory,** which states that people age because when cells metabolize energy, the by-products include unstable oxygen molecules known as *free radicals* (Chehab & others, 2008). The free radicals ricochet around the cells, damaging DNA and other cellular structures (Afanasev, 2009). The damage can lead to a range of disorders, including cancer and arthritis (Farooqui & Farooqui, 2009). Overeating is linked with an increase in free radicals, and researchers recently have found that calorie restriction—a diet restricted in calories although adequate in proteins, vitamins, and minerals—reduces the oxidative damage created by free radicals (Keijer & van Schothorst, 2008).

Mitochondrial Theory There is increasing interest in the role that *mitochondria*—tiny bodies within cells that supply essential energy for function, growth, and

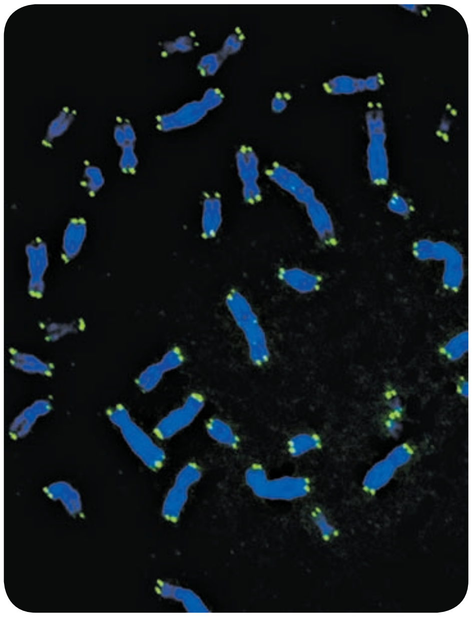


FIGURE **17.3**

TELOMERES AND AGING. The photograph shows actual telomeres lighting up the tips of chromosomes.

evolutionary theory of aging This theory states that natural selection has not eliminated many harmful conditions and nonadaptive characteristics in older adults; thus, the benefits conferred by evolutionary theory decline with age because natural selection is linked to reproductive fitness.

cellular clock theory Leonard Hayflick's theory that the maximum number of times that human cells can divide is about 75 to 80. As we age, our cells have less capability to divide.

free-radical theory A microbiological theory of aging that states that people age because inside their cells normal metabolism produces unstable oxygen molecules known as free radicals. These molecules ricochet around inside cells, damaging DNA and other cellular structures.

FIGURE **17.4**

MITOCHONDRIA. This color-coded illustration of a typical cell shows mitochondria in green. The illustration also includes the nucleus (pink) with its DNA (brown). *What are ways that changes in mitochondria might be involved in aging?*

repair—might play in aging (Scheckhuber, 2009) (see Figure 17.4). **Mitochondrial theory** states that aging is due to the decay of mitochondria. It appears that this decay is primarily from oxidative damage and loss of critical micronutrients supplied by the cell (Crane & others, 2010; Figueiredo & others, 2009).

How does this damage and loss of nutrients occur? Among the by-products of mitochondrial energy production are the free radicals we just described. According to the mitochondrial theory, the damage caused by free radicals initiates a self-perpetuating cycle in which oxidative damage impairs mitochondrial function, which results in the generation of even greater amounts of free radicals. The result is that over time the affected mitochondria become so inefficient that they cannot generate enough energy to meet cellular needs (Kadenbach, Ramzan, & Vogt, 2010; Ristow & Zarse, 2010).

Defects in mitochondria are linked with cardiovascular disease, neurodegenerative diseases such as dementia and Parkinson disease, and decline in liver functioning (Bueler, 2010; Kim, Wei, & Sowers, 2008). Mitochondria likely play important roles in neuronal plasticity (Mattson, 2007). However, it is not known whether the defects in mitochondria cause aging or are merely accompaniments of the aging process (Van Remmen & Jones, 2009).

Hormonal Stress Theory Cellular clock, free-radical, and mitochondrial theories attempt to explain aging at the cellular level. In contrast, **hormonal stress theory** argues that aging in the body's hormonal system can lower resistance to stress and increase the likelihood of disease (Finch & Seeman, 1999).

Normally, when people experience stressors, the body responds by releasing certain hormones. As people age, the hormones stimulated by stress remain at elevated levels longer than when people were younger. These prolonged, elevated levels of stress-related hormones are associated with increased risks for many diseases, including cardiovascular disease, cancer, diabetes, and hypertension (Epel, 2009; Wolkowitz & others, 2010).

Recently, a variation of hormonal stress theory has emphasized the contribution of a decline in immune system functioning with aging (Effros, 2009b; Swain & Nikolich-Zugich, 2009; Walston & others, 2009). Aging contributes to immune system deficits that give rise to infectious diseases in older adults (Bauer, Jeckel, & Luz, 2009). The extended duration of stress and diminished restorative processes in older adults may accelerate the effects of aging on immunity.

Which of these biological theories best explains aging? That question has not yet been answered. It might turn out that more than one or all of these biological processes contribute to aging (Miller, 2009).

mitochondrial theory The theory that aging is caused by the decay of mitochondria, tiny cellular bodies that supply energy for function, growth, and repair.

hormonal stress theory The theory that aging in the body's hormonal system can lower resistance to stress and increase the likelihood of disease.

Review *Connect* Reflect

LG1 Characterize longevity and the biological theories of aging.

Review

- What is the difference between life span and life expectancy? What characterizes centenarians? What sex differences exist in longevity?
- How can the differences between the young-old, old-old, and oldest-old be summarized?
- What are the five main biological theories of aging?

Connect

- Go back to Figure 17.1 and see if you can link any of the items listed with research or theories you read about in this section or in earlier chapters (e.g., item 2 states "If you are married, add four years" and in Chapter 14 we read that "Individuals who are happily married live longer, healthier lives than either divorced individuals or those who are unhappily married (Karasu, 2007; Wilson & Smallwood, 2008)").

Reflect *Your Own Personal Journey of Life*

- To what age do you think you will live? Why? To what age would you like to live?

2 The Course of Physical Development in Late Adulthood

LG2 Describe how a person's brain and body change in late adulthood.

- The Aging Brain
- The Immune System
- Physical Appearance and Movement
- Sensory Development
- The Circulatory System and Lungs
- Sexuality

The physical decline that accompanies aging usually occurs slowly, and sometimes even lost function can be restored. We'll examine the main physical changes behind the losses of late adulthood and describe ways that older adults can age successfully.

THE AGING BRAIN

How does the brain change during late adulthood? Does it retain plasticity?

The Shrinking, Slowing Brain On average, the brain loses 5 to 10 percent of its weight between the ages of 20 and 90. Brain volume also decreases (Bondare, 2007). One study found that the volume of the brain was 15 percent less in older adults than younger adults (Shan & others, 2005). Scientists are not sure why these changes occur but think they might result from a decrease in dendrites, damage to the myelin sheath that covers axons, or simply the death of brain cells. However, the current consensus is that under normal conditions adults are unlikely to lose brain cells per se (Nelson, 2008).

Some areas shrink more than others (Raz & others, 2010). The prefrontal cortex is one area that shrinks with aging, and recent research has linked this shrinkage with a decrease in working memory and other cognitive activities in older adults (Pardo & others, 2007; Sakatini, Tanida, & Katsuyama, 2010).

developmental **connection**

Brain Development. Substantial growth in the prefrontal cortex occurs throughout infancy, childhood, and adolescence. Chapter 4, p. 115; Chapter 7, p. 211; Chapter 9, p. 278; Chapter 11, p. 357

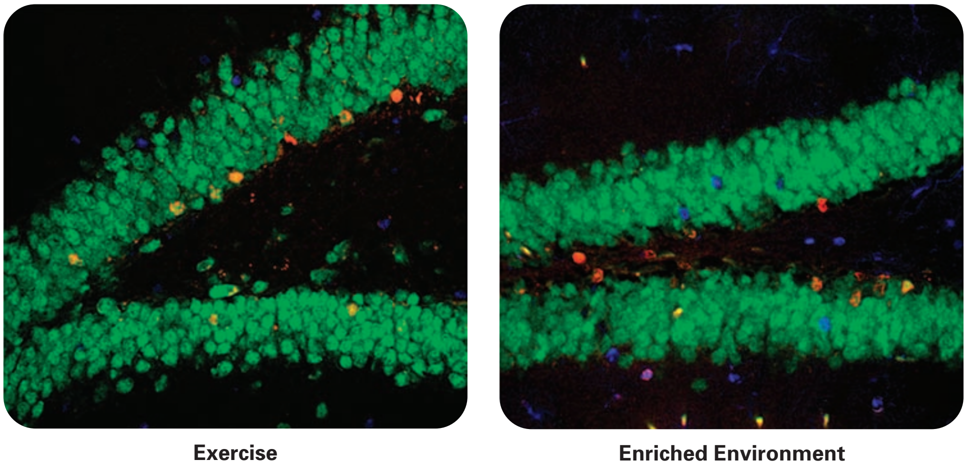
A general slowing of function in the brain and spinal cord begins in middle adulthood and accelerates in late adulthood (Birren, 2002). Both physical coordination and intellectual performance are affected. For example, after age 70 many adults no longer show a knee jerk, and by age 90 most reflexes are much slower (Spence, 1989). The slowing of the brain can impair the performance of older adults on intelligence tests and various cognitive tasks, especially those that are timed (Birren, Woods, & Williams, 1980). For example, one recent neuroimaging study revealed that older adults were more likely to be characterized by slower processing in the prefrontal cortex during retrieval of information on a cognitive task than were younger adults (Rypma, Eldreth, & Rebbechi, 2007).

Aging has also been linked to a reduction in the production of some neurotransmitters, including acetylcholine, dopamine, and gamma-aminobutyric acid (GABA) (Jagust & D'Esposito, 2009; Lester, Rogers, & Blaha, 2010). Some researchers conclude that reductions in acetylcholine may be responsible for small declines in memory functioning and with the severe memory loss associated with Alzheimer disease, which we discuss in Chapter 18 (Bentley, Driver, & Dolan, 2009; Daulatzai, 2010). Normal age-related reductions in dopamine may cause problems in planning and carrying out motor activities (Lester, Rogers, & Blaha, 2010). Severe reductions in the production of dopamine have been linked with age-related diseases characterized by a loss of motor control, such as Parkinson disease (Brooks, 2010; Mena & others, 2009). GABA helps to control the preciseness of the signal sent from one neuron to another, decreasing "noise," and its production decreases with aging (Yuan, 2008).

The Adapting Brain If the brain were a computer, this description of the aging brain might lead you to think that it could not do much of anything. However,

FIGURE **17.5**

GENERATING NEW NERVE CELLS IN ADULT MICE. Researchers have found that exercise (running) and an enriched environment (a larger cage and many toys) can cause brain cells to divide and form new brain cells (Kempermann, van Praag, & Gage, 2000). Cells were labeled with a chemical marker that becomes integrated into the DNA of dividing cells (red). Four weeks later, they were also labeled to mark neurons (nerve cells). As shown here, both the running mice and the mice in an enriched environment had many cells that were still dividing (red) and others that had differentiated into new nerve cells (orange).



developmental **connection**

Brain Development. At the peak of neurogenesis early in prenatal development, it is estimated that as many as 200,000 neurons are being generated every minute. Chapter 3, p. 85

unlike a computer the brain has remarkable repair capability (Jessberger & Gage, 2010; Prakash, Snook, & Kramer). Even in late adulthood, the brain loses only a portion of its ability to function, and the activities older adults engage in can influence the brain's development. For example, in a recent fMRI study, higher levels of aerobic fitness were linked with greater volume in the hippocampus, which translates into better memory (Erickson & others, 2009).

Can adults, even aging adults, generate new neurons? Researchers have found that **neurogenesis,** the generation of new neurons, does occur in lower mammalian species, such as mice (Marlatt & others, 2010). Also, research indicates that exercise and an enriched, complex environment can generate new brain cells in rats and mice, and that stress reduces their survival rate (Segovia, Arco, & Mora, 2009) (see Figure 17.5). Researchers recently have discovered that if rats are cognitively challenged to learn something, new brain cells survive longer (Shors, 2009).

It also is now accepted that neurogenesis can occur in human adults (Aimone, Wiles, & Gage, 2009; Hagg, 2009). However, researchers have documented neurogenesis in only two brain regions: the hippocampus, which is involved in memory, and the olfactory bulb, which is involved in smell (Arenkiel, 2010; Zou & others, 2010). It also is not known what functions these new brain cells perform, and at this point researchers have documented that they last for only several weeks (Nelson, 2006). Researchers currently are studying factors that might inhibit and promote neurogenesis, including various drugs, stress, and exercise (Gil-Mohapel & others, 2010; van Praag, 2009). They also are examining how the grafting of neural stem cells to various regions of the brain, such as the hippocampus, might increase neurogenesis (Farin & others, 2009; Szulwach & others, 2010).

Dendritic growth can occur in human adults, possibly even in older adults (Eliasieh, Liets, & Chalupa, 2007). Recall from Chapter 4, "Physical Development in Infancy," that dendrites are the receiving portion of the neuron. One study compared the brains of adults at various ages (Coleman, 1986). From the forties through the seventies, the growth of dendrites increased. However, in people in their nineties dendritic growth no longer occurred. This dendritic growth might compensate for the possible loss of neurons through the seventies but not in the nineties. Lack of dendritic growth in older adults could be due to a lack of environmental stimulation and activity. Further research is needed to clarify what changes characterize dendrites during aging.

Stanley Rapaport (1994), chief of the neurosciences laboratory at the National Institute on Aging, demonstrated another way in which the aging brain can adapt. He compared the brains of younger and older people engaged in the same tasks. The older brains had rewired themselves to compensate for losses. If one neuron was not up to the job, neighboring neurons helped to pick up the slack. Rapaport

neurogenesis The generation of new neurons.

concluded that as brains age, they can shift responsibilities for a given task from one region to another.

Changes in lateralization may provide one type of adaptation in aging adults (Angel & others, 2009; Zhu, Zacks, & Slade, 2010). Recall that lateralization is the specialization of function in one hemisphere of the brain or the other. Using neuroimaging techniques, researchers found that brain activity in the prefrontal cortex is lateralized less in older adults than in younger adults when they are engaging in cognitive tasks (Cabeza, 2002; Rossi & others, 2005). For example, Figure 17.6 shows that when younger adults are given the task of recognizing words they have previously seen, they process the information primarily in the right hemisphere; older adults are more likely to use both hemispheres (Madden & others, 1999). The decrease in lateralization in older adults might play a compensatory role in the aging brain. That is, using both hemispheres may improve the cognitive functioning of older adults.

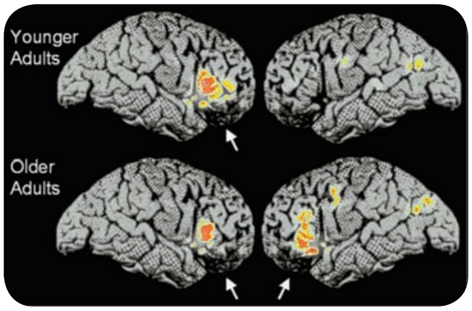


FIGURE **17.6**

THE DECREASE IN BRAIN LATERALIZATION IN OLDER ADULTS. Younger adults primarily used the right prefrontal region of the brain (*top left photo*) during a recall memory task, whereas older adults used both the left and right prefrontal regions (*bottom two photos*).

developmental **connection**

Language. Speech and grammar are strongly lateralized, depending on activity in the left hemisphere. Chapter 4, p. 114

Of course, there are individual differences in how the brain changes in older adults (Raz & others, 2010). Consider highly successful businessman 80-year-old T. Boone Pickens, who continues to lead a highly active lifestyle, regularly exercising and engaging in cognitively complex work. Pickens recently underwent an fMRI in cognitive neuroscientist Denise Park's laboratory, during which he was presented with various cognitive tasks. Instead of both hemispheres being active, his left hemisphere was still dominant, just as is the case for most younger adults (Helman, 2008). Indeed, as the cognitive tasks became more complex, the more Pickens used the left hemisphere of his brain (see Figure 17.7). Does staying intellectually challenged affect one's quality of life and longevity? To read further about aging and the brain, see *Connections Through Research*.

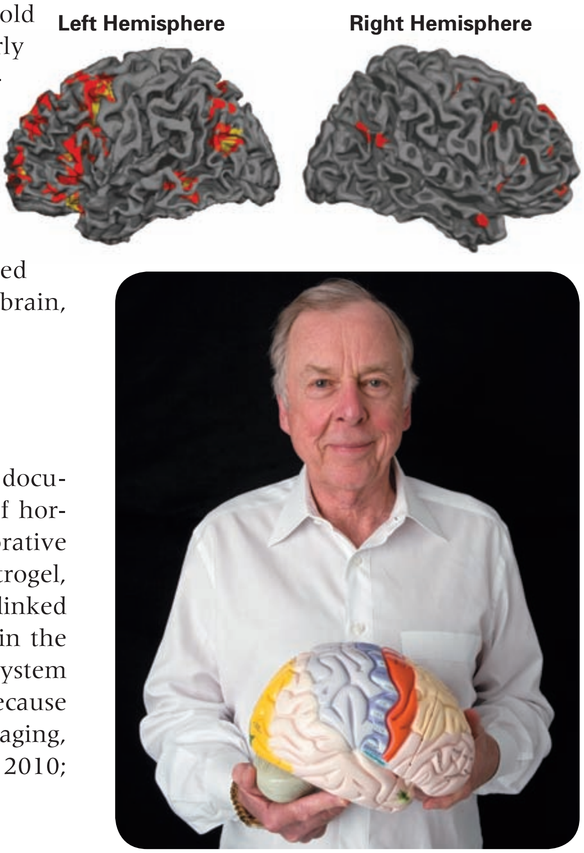


FIGURE **17.7**

INDIVIDUAL DIFFERENCES IN HEMISPHERIC SPECIALIZATION IN OLDER ADULTS. On tough questions—such as "Are 'zombie' and 'unicorn' living or nonliving?"—the red patches indicate that 80-year-old T. Boone Pickens (above, holding a model of the brain) was relying mainly on the left hemisphere of his brain to make a decision. Most older adults show a stronger bilateral activation, using both hemispheres more equally than Pickens, whose lateralization was more characteristic of younger adults.

THE IMMUNE SYSTEM

Decline in the functioning of the body's immune system with aging is well documented (Agarwal & Busse, 2010). As we indicated earlier in our discussion of hormonal stress theory, the extended duration of stress and diminished restorative processes in older adults may accelerate the effects of aging on immunity (Zitrogel, Kepp, & Kroemer, 2010). Also, malnutrition involving low levels of protein is linked to a decrease in T cells that destroy infected cells and hence to deterioration in the immune system (Hughes & others, 2010). Exercise can improve immune system functioning (De la Fuente & Gimenez-Liort, 2010; Sakamoto & others, 2009). Because of the decline in the functioning of the immune system that accompanies aging, vaccination against influenza is especially important in older adults (Maggi, 2010; Michel, 2010).

PHYSICAL APPEARANCE AND MOVEMENT

In late adulthood, the changes in physical appearance that began occurring during middle age (as discussed in Chapter 15) become more pronounced. Wrinkles and age spots are the most noticeable changes.

We also get shorter when we get older. As we saw in Chapter 15, both men and women become shorter in late adulthood because of bone loss in their vertebrae (Hoyer & Roodin, 2009).

Our weight usually drops after we reach 60 years of age. This likely occurs because we lose muscle, which also gives our bodies a "sagging" look (Evans, 2010).

connecting through research

Does Staying Intellectually Challenged Affect One's Quality of Life and Longevity?

(*a*) (*b*)

(*a*) Sister Marcella Zachman (*left*) finally stopped teaching at age 97. Now, at 99, she helps ailing nuns exercise their brains by quizzing them on vocabulary or playing a card game called Skip-Bo, at which she deliberately loses. Sister Mary Esther Boor (*right*), also 99 years of age, is a former teacher who stays alert by doing puzzles and volunteering to work the front desk. (*b*) A technician holds the brain of a deceased Mankato nun. The nuns donate their brains for research that explores the effects of stimulation on brain growth.

The Nun Study, directed by David Snowdon, is an intriguing ongoing investigation of aging in 678 nuns, many of whom are from a convent in Mankato, Minnesota (Snowdon, 2003; Tyas & others, 2007). Each of the 678 nuns agreed to participate in annual assessments of their cognitive and physical functioning. They also agreed to donate their brains for scientific research when they die, and they are the largest group of brain donors in the world. Examination of the nuns' donated brains, as well as others', has led neuroscientists to believe that the brain has a remarkable capacity to change and grow, even in old age. The Sisters of Notre Dame in Mankato lead an intellectually challenging life, and brain researchers believe this contributes to their quality of life as older adults and possibly to their longevity.

Findings from the Nun Study so far include:

- Idea density, a measure of linguistic ability assessed early in the adult years (age 22), was linked with higher brain weight, fewer incidences of mild cognitive impairment, and fewer characteristics of Alzheimer disease in 75- to 95-year-old nuns (Riley & others, 2005).
- Positive emotions early in adulthood were linked to longevity (Danner, Snowdon, & Friesen, 2001). Handwritten autobiographies from 180 nuns, composed when they were 22 years of age, were scored for emotional content. The nuns whose early writings had higher scores for positive emotional content were more likely to still be alive at 75 to 95 years of age than their counterparts whose early writings were characterized by negative emotional content.
- Sisters who had taught for most of their lives showed more moderate declines in intellectual skills than those who had spent most of their lives in service-based tasks, which supports the notion that stimulating the brain with intellectual activity keeps neurons healthy and alive (Snowdon, 2002).

This and other research provides hope that scientists will discover ways to tap into the brain's capacity to adapt in order to prevent and treat brain diseases. For example, scientists might learn more effective ways to help older adults recover from strokes (Carter & others, 2010; Saur & others, 2010). Even when areas of the brain are permanently damaged by stroke, new message routes can be created to get around the blockage or to resume the function of that area, indicating that the brain does adapt.

Figure 17.8 shows the decline in percentage of muscle and bone from age 25 to age 75, and the corresponding increase in the percentage of fat.

Older adults move more slowly than young adults, and this slowing occurs for movements with a wide range of difficulty (Sakuma & Yamaguchi, 2010) (see Figure 17.9). Even when they perform everyday tasks such as reaching and grasping, moving from one place to another, and continuous movement, older adults tend to move more slowly than when they were young (Mollenkopf, 2007). Adequate mobility is an important aspect of maintaining an independent and active lifestyle in late adulthood (Clark & others, 2010; Webber, Porter, & Menec, 2010). One recent study of the functional ability of noninstitutionalized individuals 70 years of age and older revealed that over an eight-year period, the most deterioration occurred in their

developmental **connection**

Biological Processes. On average, men lose 1 to 2 inches in height from 30 to 70 and women can lose an much as 2 inches in height from 25 to 75. Chapter 15, p. 478

mobility (Holstein & others, 2007). Another study revealed that obesity was linked to mobility limitation in older adults (Houston & others, 2009). The good news is that regular walking decreases the onset of physical disability in older adults (Newman & others, 2006). Also, exercise and appropriate weight lifting can help to reduce the decrease in muscle mass and improve the older person's body appearance (Peterson & others, 2009; Venturelli & others, 2010; Weiss & others, 2010). And a recent study revealed that it's not just physical exercise that is linked to preserving older adults' motor functions; in this study, engaging in social activities protected against loss of motor abilities (Buchman & others, 2009).

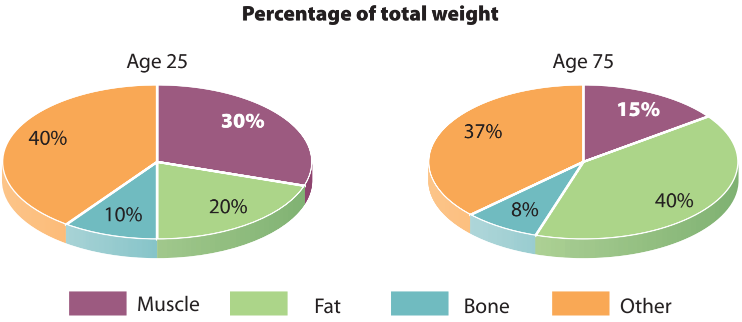


FIGURE **17.8**

CHANGES IN BODY COMPOSITION OF BONE, MUSCLE, AND FAT FROM 25 TO 75 YEARS OF AGE. Notice the decrease in bone and muscle and the increase in fat from 25 to 75 years of age.

SENSORY DEVELOPMENT

Seeing, hearing, and other aspects of sensory functioning are linked with our ability to perform everyday activities (Cimarolli, 2009; Wood & others, 2010). This link was documented in a study of more than 500 adults, 70 to 102 years of age, in which sensory acuity, especially in vision, was related to whether and how well older adults bathed and groomed themselves, completed household chores, engaged in intellectual activities, and watched TV (Marsiske, Klumb, & Baltes, 1997). How do vision, hearing, taste, smell, touch, and pain change in late adulthood?

Vision

With aging, visual acuity, color vision, and depth perception decline. Several diseases of the eye also may emerge in aging adults.

Visual Acuity In late adulthood, the decline in vision that began for most adults in early or middle adulthood becomes more pronounced (Dillon & others, 2010; Lindenberger & Ghisletta, 2009). Night driving is especially difficult, to some extent because tolerance for glare diminishes (Babizhayev, Minasyan, & Richer, 2009; Wood & others, 2010). *Dark adaptation* is slower—that is, older individuals take longer to recover their vision when going from a well-lighted room to semidarkness. The area of the visual field becomes smaller, a change suggesting that the intensity of a stimulus in the peripheral area of the visual field needs to be increased if the stimulus is to be seen. Events taking place away from the center of the visual field might not be detected (Stutts, 2007).

This visual decline often can be traced to a reduction in the quality or intensity of light reaching the retina. At 60 years of age, the retina receives only about one-third as much light as it did at 20 years of age (Scialfa & Kline, 2007). In extreme old age, these changes might be accompanied by degenerative changes in the retina, causing severe difficulty in seeing. Large-print books and magnifiers might be needed in such cases.

An extensive study of visual changes in adults found that the age of older adults was a significant factor in how extensively their visual functioning differed from that of younger adults (Brabyn & others, 2001). Beyond 75, and more so beyond age 85, older adults showed significantly worse performance on a number of visual tasks when compared with young adults and older adults in their sixties and early seventies. The greatest decline in visual perception beyond 75, and especially beyond 85, involved glare. The older adults, especially those 85 and older, fared much worse in being able to see clearly when glare was present, and they took much longer to recover from glare than younger adults (see Figure 17.10). For example, whereas young adults recover vision following glare in less than 10 seconds, 50 percent of 90-year-olds have not recovered vision after 1.5 minutes.

Recent research has shown that sensory decline in older adults is linked to a decline in cognitive functioning. One study of individuals in their 70s revealed that visual decline was related to slower speed of processing information, which in turn was associated with greater cognitive decline (Clay & others, 2009).

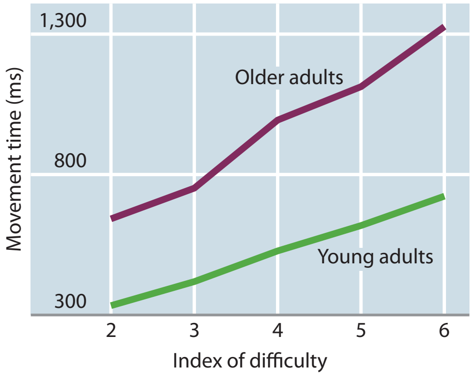


FIGURE **17.9**

MOVEMENT AND AGING. Older adults take longer to move than young adults, and this change occurs across a range of movement difficulty (Ketcham & Stelmach, 2001).

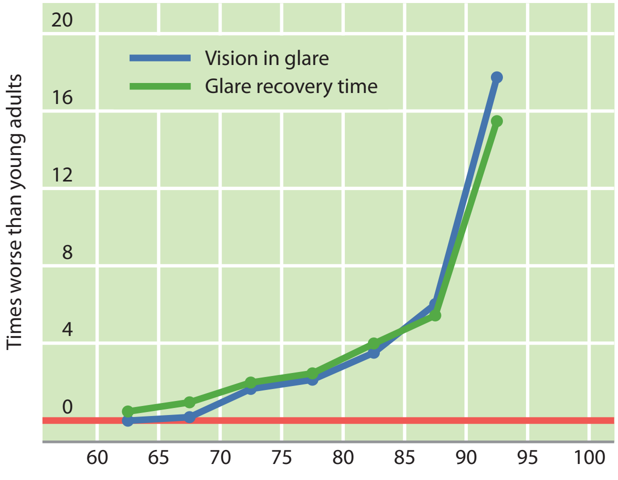


FIGURE **17.10**

RATES OF DECLINE IN VISUAL FUNCTIONING RELATED TO GLARE IN ADULTS OF DIFFERENT AGES. Older adults, especially those 85 and older, fare much worse than younger adults in being able to see clearly when glare is present, and their recovery from glare is much slower. These data were collected from a random sample of community-dwelling older adults living in Marin County, California. For each age, the factor by which the group's median performance was worse than normative values for young adults is shown.

developmental **connection**

Perception. The visual cliff was used to determine if infants have depth perception. Chapter 4, p. 138

Color Vision Color vision also may decline with age in older adults as a result of the yellowing of the lens of the eye (Scialfa & Kline, 2007). This decline is most likely to occur in the green-blue-violet part of the color spectrum. As a result, older adults may have trouble accurately matching closely related colors such as navy socks and black socks.

Depth Perception As with many areas of perception, depth perception changes little after infancy until adults become older. Depth perception typically declines in late adulthood, which can make it difficult for the older adult to determine how close or far away or how high or low something is (Bian & Anderson, 2008). A decline in depth perception can make steps or street curbs difficult to manage.

Diseases of the Eye Three diseases that can impair the vision of older adults are cataracts, glaucoma, and macular degeneration:

- **Cataracts** involve a thickening of the lens of the eye that causes vision to become cloudy, opaque, and distorted (Sugimoto, Kuze, & Uji, 2008). By age 70, approximately 30 percent of individuals experience a partial loss of vision due to cataracts. Initially, cataracts can be treated by glasses; if they worsen, a simple surgical procedure can remove them (Chung & others, 2009).
- **Glaucoma** involves damage to the optic nerve because of the pressure created by a buildup of fluid in the eye (Fechtner & others, 2010; Jampel & others, 2009). Approximately 1 percent of individuals in their seventies and 10 percent of those in their nineties have glaucoma, which can be treated with eyedrops. If left untreated, glaucoma can ultimately destroy a person's vision (Musch & others, 2009).
- **Macular degeneration** is a disease that involves deterioration of the *macula* of the retina, which corresponds to the focal center of the visual field. Individuals with macular degeneration may have relatively normal peripheral vision but be unable to see clearly what is right in front of them (Ghosh & others, 2010; Rovner & others, 2009) (see Figure 17.11). It affects 1 in 25 individuals from 66 to 74 years of age and 1 in 6 of those 75 years old and older. One study revealed that cigarette smoking is a contributing factor in macular degeneration (Schmidt & others, 2006). If the disease is detected early, it can be treated with laser surgery (Fleckenstein & others, 2010; Sorensen & Kemp, 2010). However, macular degeneration is difficult to treat and thus is a leading cause of blindness in older adults (Cacho & others, 2010; Lucifero, 2010).

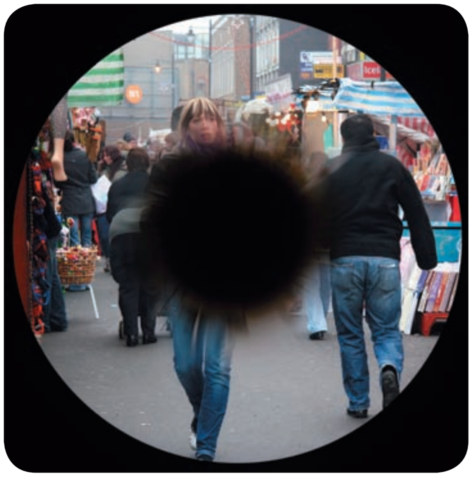


FIGURE **17.11**

MACULAR DEGENERATION. This simulation of the effect of macular degeneration shows how individuals with this eye disease can see their peripheral field of vision but can't clearly see what is in their central visual field.

Hearing For hearing as for vision, the age of older adults is important in determining the degree of decline (Dillon & others, 2010; Stenklev, Vik, & Laukli, 2004) (see Figure 17.12). The decline in vision and hearing is much greater in individuals 75 years and older than in individuals 65 to 74 years of age (Charness & Bosman, 1992).

Hearing impairment usually does not become much of an impediment until late adulthood (Fozard & Gordon-Salant, 2001). Only 19 percent of individuals from 45 to 54 years of age experience some type of hearing problem, but for those 75 to 79, the figure reaches 75 percent (Harris, 1975). It has been estimated that 15 percent of the population over the age of 65 is legally deaf, usually due to degeneration of the *cochlea,* the primary neural receptor for hearing in the inner ear (Adams, 2009).

Older adults often don't recognize that they have a hearing problem, deny that they have one, or accept it as a part of growing old (Fowler & Leigh-Paffenroth, 2007). Older women are more likely to seek treatment for their hearing problem than older men (Fowler & Leigh-Paffenroth, 2007).

Two devices can be used to minimize the problems linked to hearing loss in older adults: (1) hearing aids that amplify sound to reduce middle ear–based conductive hearing loss, and (2) cochlear implants that restore some hearing following

Perceptual System	Young-Old (65 to 74 years)	Old-Old (75 years and older)
Vision	There is a loss of acuity even with corrective lenses. Less transmission of light occurs through the retina (half as much as in young adults). Greater susceptibility to glare occurs. Color discrimination ability decreases.	There is a significant loss of visual acuity and color discrimination, and a decrease in the size of the perceived visual field. In late old age, people are at significant risk for visual dysfunction from cataracts and glaucoma.
Hearing	There is a significant loss of hearing at high frequencies and some loss at middle frequencies. These losses can be helped by a hearing aid. There is greater susceptibility to masking of what is heard by noise.	There is a significant loss at high and middle frequencies. A hearing aid is more likely to be needed than in young-old age.

FIGURE **17.12**

VISION AND HEARING DECLINE IN THE YOUNG-OLD AND THE OLD-OLD

neurosensory hearing loss (Lockey, Jennings, & Shaw, 2010; Lu, Litovsky, & Zeng, 2010). Currently, researchers are exploring the use of stem cells as an alternative to the use of cochlear implants (Pauley & others, 2008).

Smell and Taste Most older adults lose some of their sense of smell or taste, or both (Murphy, 2009). These losses often begin around 60 years of age (Hawkes, 2006). A majority of individuals 80-years-of-age and older experience a significant reduction in smell (Lafreniere & Mann, 2009). Researchers have found that older adults show a greater decline in their sense of smell than in their taste (Schiffman, 2007). Smell and taste decline less in healthy older adults than in their less healthy counterparts.

Reductions in the ability to smell and taste can reduce enjoyment of food and life satisfaction (Rolls & Drewnowski, 2007). Also, a decline in the sense of smell can reduce the ability to detect smoke from a fire. If elderly individuals need to be encouraged to eat more, compounds that stimulate the olfactory nerve are sometimes added to food. However, many older adults compensate for their diminished taste and smell by eating sweeter, spicier, and saltier foods, which can lead to eating more low-nutrient, highly seasoned "junk food" (Hoyer & Roodin, 2009). Further, a recent study of people aged 19 to 39, 40 to 59, and 60 and older revealed that although adults' ability to detect a smell declined as they got older, the perceived pleasantness of a smell increased in the older group (Markovic & others, 2007).

Researchers have found that most older adults show a reduction in their sense of smell and taste. However, a recent study revealed that the perceived pleasantness of a smell increased in older adults (Markovic & others, 2007).

Touch and Pain Changes in touch and pain are also associated with aging (Gagliese, 2009; Schmader & others, 2010). One study found that with aging individuals could detect touch less in the lower extremities (ankles, knees, and so on) than in the upper extremities (wrists, shoulders, and so on) (Corso, 1977). For most older adults, a decline in touch sensitivity is not problematic (Hoyer & Roodin, 2009). And a recent study revealed that older adults who are blind retain a high level of touch sensitivity, which likely is linked to their use of active touch in their daily lives (Legge & others, 2008).

Older adults are less sensitive to pain and suffer from it less than younger adults (Harkins, Price, & Martinelli, 1986). Although decreased sensitivity to pain can help older adults cope with disease and injury, it can also mask injury and illness that need to be treated.

THE CIRCULATORY SYSTEM AND LUNGS

Cardiovascular disorders increase in late adulthood (Ballard, 2010; Prystowsky & others, 2010). In one analysis, 57 percent of 80-year-old-men and 60 percent of

cataracts A thickening of the lens of the eye that causes vision to become cloudy, opaque, and distorted.

glaucoma Damage to the optic nerve because of the pressure created by a buildup of fluid in the eye.

macular degeneration A disease that involves deterioration of the macula of the retina, which corresponds to the focal center of the visual field.

What are some characteristics of sexuality in older adults? How does sexuality change as older adults go through the late adulthood period?

81-year-old women had hypertension, and 32 percent of the men and 31 percent of the women had experienced a stroke (Aronow, 2007).

Today, most experts on aging even recommend that consistent blood pressures above 120/80 should be treated to reduce the risk of heart attack, stroke, or kidney disease (Krakoff, 2008). A rise in blood pressure with age can be linked with illness, obesity, stiffening of blood vessels, stress, or lack of exercise (Shizukuda, Plummer, & Harrelson, 2010). The longer any of these factors persist, the worse the individual's blood pressure gets (Miura & others, 2009). Various drugs, a healthy diet, and exercise can reduce the risk of cardiovascular disease in older adults (Coke & Fletcher, 2010; Hedberg & others, 2009). One recent study revealed that exercise capacity and walking were the best predictors of earlier death in older adults with heart problems (Reibis & others, 2010).

Lung capacity drops 40 percent between the ages of 20 and 80, even without disease (Fozard, 1992). Lungs lose elasticity, the chest shrinks, and the diaphragm weakens (Cherniack & Cherniack, 2007). The good news, though, is that older adults can improve lung functioning with diaphragm-strengthening exercises. Severe impairments in lung functioning and death can result from smoking (Whincup & others, 2006).

SEXUALITY

In the absence of two circumstances—disease and the belief that old people are or should be asexual—sexuality can be lifelong (Woloski-Wruble & others, 2010). Aging, however, does induce some changes in human sexual performance, more so in the male than in the female (Bauman, 2008).

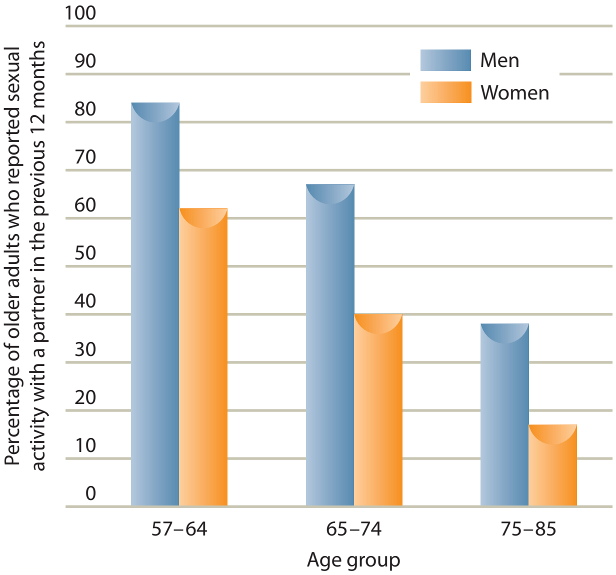


FIGURE **17.13**

SEXUAL ACTIVITY IN OLDER ADULTS WITH A PARTNER

Orgasm becomes less frequent in males with age, occurring in every second to third attempt rather than every time. More direct stimulation usually is needed to produce an erection. From 65 to 80 years of age, approximately one out of four men have serious problems getting and/or keeping erections, and after 80 years of age the percentage rises to one out of two men (Butler & Lewis, 2002).

A recent interview study of more than 3,000 adults 57 to 85 years of age revealed that many older adults are sexually active as long as they are healthy (Lindau & others, 2007). Sexual activity did decline through the later years of life: 73 percent of people 57 to 64 years old, 53 percent of people 65 to 74 years old, and 26 percent of adults 75 to 85 years old reported that they were sexually active. Even in the sexually active oldest group (75 to 85), more than 50 percent said they still have sex at least two to three times a month. Fifty-eight percent of sexually active 65- to 74-year-olds and 31 percent of 75- to 85-year-olds said they engage in oral sex. As with middle-aged and younger adults, older adults who did not have a partner were far less likely to be sexually active than those who had a partner. For older adults with a partner who reported not having sex, the main reason was poor health, especially the male partner's physical health.

A recent large scale study of individuals from 57 to 85 years of age revealed that sexual activity, a good quality sexual life, and interest in sex were positively related to health in middle and late adulthood (Lindau & Gavrilova, 2010). Also in this study, these aspects of sexuality were higher for aging males than aging women, and this gap widened with age. Further, sexually active life expectancy was longer for men than women, but men lost more years of sexually active life due to poor health than women.

As indicated in Figure 17.13, sexual activity with a partner declined from the last part of middle adulthood through late adulthood, with a lower rate of sexual activity with a partner for women than men. Indeed, a challenge for a sexually interested older woman is not having a partner. At 70 years of age, approximately 70 percent of women don't have a partner compared with only about 35 percent of men. Many older women's husbands have died, and many older men are with younger women.

developmental **connection**

Sexuality. Older adults may express their sexuality differently than younger adults, especially enjoying touching and caressing in their sexual relationship when sexual intercourse becomes difficult. Ch. 13, p. 425 and Ch. 15, p. 486

Various therapies for older adults who report sexual difficulties have been effective (Bain, 2010; Malatesta, 2007). In one study, sex education—which consisted largely of simply giving sexual information—led to increased sexual interest, knowledge, and activity in older adults (White & Catania, 1981). Even when intercourse is impaired by infirmity, other relationship needs persist, among them closeness, sensuality, and being valued as a man or a woman. We discuss these needs in Chapter 19.

Review *Connect* Reflect

LG2 Describe how a person's brain and body change in late adulthood.

Review

- How much plasticity and adaptability does the aging brain have?
- How does the immune system change with aging?
- What changes in physical appearance and movement characterize late adulthood?
- How do vision, hearing, smell and taste, touch, and sensitivity to pain change in older adults?
- How does the circulatory system change in older adults? How do the lungs change in older adults?
- What is the nature of sexuality in late adulthood?

Connect

- Many of the declines in the functioning of individuals in late adulthood start occurring in middle adulthood. Which declines in functioning mainly occur in late adulthood?

Reflect *Your Own Personal Journey of Life*

- If you could interview the Mankato nuns, what questions would you want to ask them to help you improve your understanding of successful aging?

3 Health

LG3 Identify health problems in older adults and how they can be treated.

Health Problems

Substance Use and Abuse

Exercise, Nutrition, and Weight

Health Treatment

How healthy are older adults? What types of health problems do they have, and what can be done to maintain or improve their health and ability to function in everyday life?

HEALTH PROBLEMS

As we age, the probability increases that we will have some disease or illness (Ferrucci & Koh, 2007). The majority of adults still alive at 80 years of age or older are likely to have some type of impairment. Chronic diseases (those with a slow onset and a long duration) are rare in early adulthood, increase in middle adulthood, and become more common in late adulthood (Kane, 2007). As indicated in Figure 17.14, 84 percent of U.S. adults 65 years of age and older have one or more chronic conditions, and 62 percent have two or more chronic conditions (Partnership for Solutions, 2002).

As shown in Figure 17.15, arthritis is the most common chronic disorder in late adulthood, followed by hypertension. Older women have a higher incidence of arthritis and hypertension and are more likely to have visual problems, but are less likely to have hearing problems, than older men are.

Although adults over the age of 65 often have a physical impairment, many of them can still carry on their

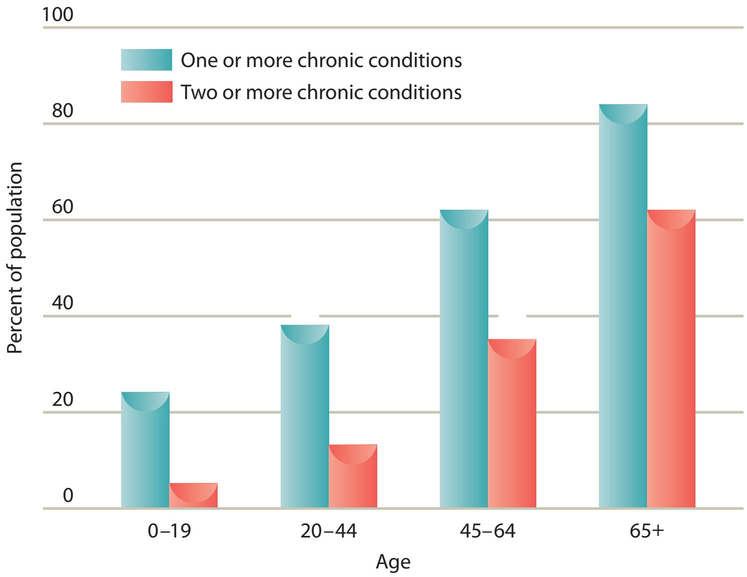


FIGURE **17.14**

PERCENT OF U.S. POPULATION WITH CHRONIC CONDITIONS ACROSS AGE GROUPS

everyday activities or work. Chronic conditions associated with the greatest limitation on work are heart conditions (52 percent), diabetes (34 percent), asthma (27 percent), and arthritis (27 percent). Conflict in relationships has been linked with greater decline in older adults with diabetes or hypertension (Seeman & Chen, 2002). Low income is also strongly related to health problems in late adulthood (Ferraro, 2006). Approximately three times as many poor as nonpoor older adults report that their activities are limited by chronic disorders. Recent studies document links between low socioeconomic status and health problems (Friedman & Herd, 2010; Yang & Lee, 2010). One study revealed that frailty increased for low-income older adults, regardless of their ethnicity (Szanton & others, 2010).

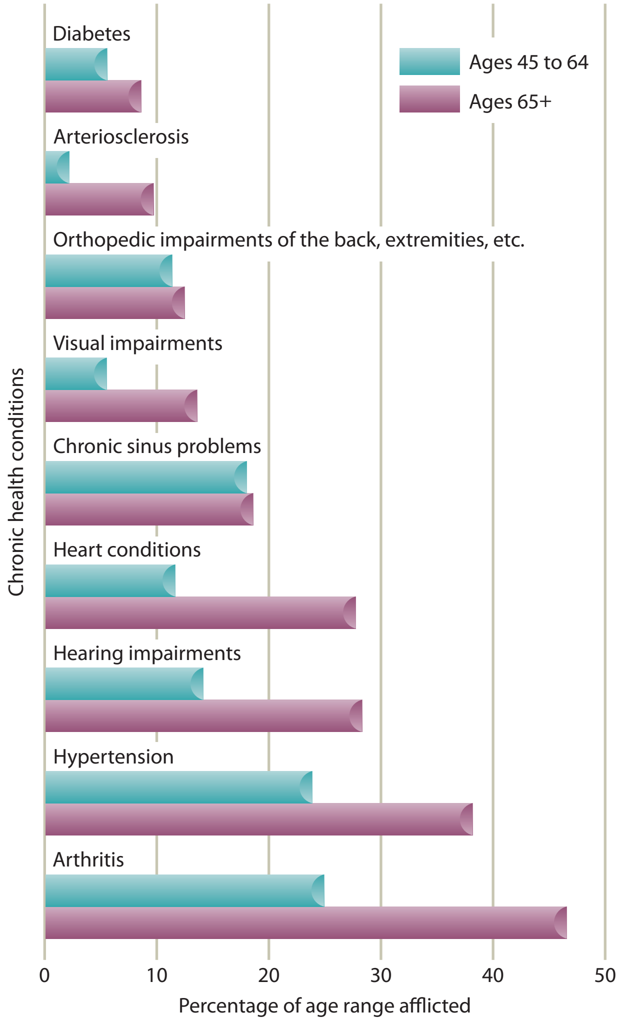


FIGURE **17.15**

THE MOST PREVALENT CHRONIC CONDITIONS IN MIDDLE AND LATE ADULTHOOD

Causes of Death in Older Adults

Nearly 60 percent of U.S. adults 65 to 74 years old die of cancer or cardiovascular disease (National Center for Health Statistics, 2008). As we saw in Chapter 15, cancer recently replaced cardiovascular disease as the leading cause of death in U.S. middle-aged adults. The same realignment of causes of death has also occurred in 65- to 74-year-olds with cancer now the leading cause of death in this age group (National Center for Health Statistics, 2010d). The decline in cardiovascular disease in middle-aged and older adults is due to improved drugs, a decrease in smoking, better diet, and an increase in exercise.

However, in the age groups 75 to 84 and 85 and over, cardiovascular disease still is the leading cause of death (National Center for Health Statistics, 2010d). As individuals age through the late adult years, the older they are the more likely they will die of cardiovascular disease than cancer (National Center for Health Statistics, 2010d).

Ethnicity is linked with the death rates of older adults (National Center for Health Statistics, 2010d). Among ethnic groups in the United States, African Americans have high death rates for stroke, heart disease, lung cancer, and female breast cancer. Asian Americans and Latinos have low death rates for these diseases. In the last decade, death rates for most diseases in African Americans, Latinos, and Asian Americans have decreased. However, death rates for most diseases still remain high for African Americans (National Center for Health Statistics, 2010d).

Arthritis

Arthritis is an inflammation of the joints accompanied by pain, stiffness, and movement problems. Arthritis is especially common in older adults (Baker, 2009; Villeneuve & Haraoui, 2010). This disorder can affect hips, knees, ankles, fingers, and vertebrae. Individuals with arthritis often experience pain and stiffness, as well as problems in moving about and performing routine daily activities. There is no known cure for arthritis. However, the symptoms of arthritis can be reduced by drugs, such as aspirin, range-of-motion exercises for the afflicted joints, weight reduction, and in extreme cases, replacement of the crippled joint with a prosthesis (Kokkalis, Schmidt, & Sotereanos, 2009; Xu & others, 2010). Recent studies also document the benefits of exercise in older adults with arthritis (Chang & others, 2009; Metsios & others, 2010). For example, a high-intensity, 16-week, strength-training program significantly increased the strength and reduced the pain of arthritis patients (Flint-Wagner & others, 2009).

> How many of us older persons have really been prepared for the second half of life, for old age, and eternity?
>
> —Carl Jung
>
> *Swiss Psychoanalyst, 20th Century*

Osteoporosis

Normal aging brings some loss of bone tissue, but in some instances loss of bone tissue can become severe. **Osteoporosis** involves an extensive loss of bone tissue. Osteoporosis is the main reason many older adults walk with a marked stoop (Ishikawa & others, 2009). Women are especially vulnerable to osteoporosis, the leading cause of broken bones in women (Bessette & others,

arthritis Inflammation of the joints that is accompanied by pain, stiffness, and movement problems; especially common in older adults.

osteoporosis A chronic condition that involves an extensive loss of bone tissue and is the main reason many older adults walk with a marked stoop. Women are especially vulnerable to osteoporosis.

2009). Approximately 80 percent of osteoporosis cases in the United States occur in females, 20 percent in males. Almost two-thirds of all women over the age of 60 are affected by osteoporosis. It is more common in non-Latina White, thin, and small-framed women.

Osteoporosis is related to deficiencies in calcium, vitamin D, estrogen, and lack of exercise (Bonjour & others, 2009; Dionyssiotis & others, 2010). To prevent osteoporosis, young and middle-aged women should eat foods rich in calcium (such as dairy products, broccoli, turnip greens, and kale), get more exercise, and avoid smoking (Cashman, 2008; Iwamoto & others, 2009; Vondracek, 2010). A recent study revealed that taking a high supplement level of vitamin C was linked to fewer hip fractures in older women (Sahni & others, 2009). Drugs such as Fosamax can be used to reduce the risk of osteoporosis (Suzuki & others, 2008). Aging women should also get bone density checks.

Accidents Accidents are the sixth leading cause of death among older adults (National Center for Health Statistics, 2010d). Injuries resulting from a fall at home or during a traffic accident in which an older adult is a driver or an older pedestrian is hit by a vehicle are common (Verghese & others, 2010). Falls are the leading cause of injury deaths among adults who are 65 years and older (National Center for Health Statistics, 2010d). Each year, approximately 200,000 adults over the age of 65 (most of them women) fracture a hip in a fall. Half of these older adults die within 12 months, frequently from pneumonia. Because healing and recuperation are slower in older adults, an accident that is only a temporary setback for a younger person may result in long-term hospital or home care for an older adult (Duque, Demontiero, & Troen, 2009). A recent study revealed that participation in an exercise class once a week for three years reduced the fall risk and the number of falling incidents in older adults who were at high risk for falling (Yokoya, Demura, & Sato, 2009). In another study, Tai Chi, a form of balance training, improved the coordination of older adults in challenging conditions (Wong & others, 2001).

SUBSTANCE USE AND ABUSE

In many cases, older adults are taking multiple medications, which can increase the risks associated with consuming alcohol or other drugs. For example, when combined with tranquilizers or sedatives, alcohol use can impair breathing, produce excessive sedation, and be fatal.

How extensive is substance abuse in older adults? A national survey found that binge drinking (having five or more drinks in one day) declines through the late adulthood years (National Center for Health Statistics, 2002) (see Figure 17.16). Indeed, a majority (58 percent) of U.S. adults 65 years and older completely abstain from alcohol, an increase from 38 percent of 45- to 64-year-olds. These declines are usually attributed to an increase in illness and disease.

Despite these declines in alcohol use, the Substance Abuse and Mental Health Services Administration (2002) has identified substance abuse among older adults as the "invisible epidemic" in the United States. The belief is that substance abuse often goes undetected in older adults, and there is concern about older adults who abuse not only illicit drugs but prescription drugs as well (Segal, 2007). Too often, screening questionnaires are not appropriate for older adults, and the consequences of alcohol abuse—such as depression, inadequate nutrition, congestive heart failure, and frequent falls—may erroneously be attributed to other medical or psychological conditions (Hoyer & Roodin, 2009). Because of the dramatic increase in the number of older adults anticipated over the 21st century, substance abuse is likely to characterize an increasing number of older adults (Atkinson, Ryan, & Turner, 2001).

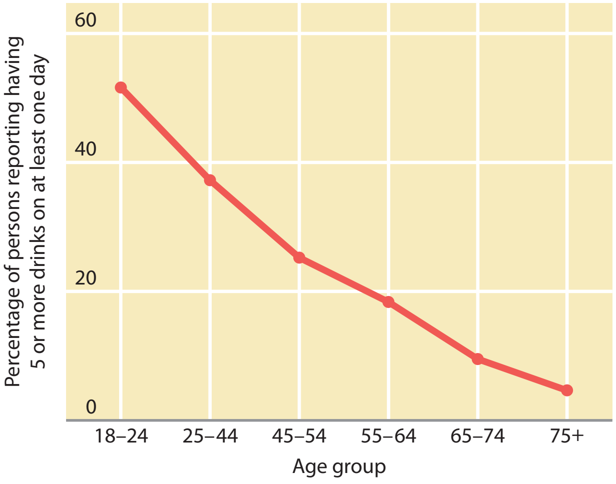
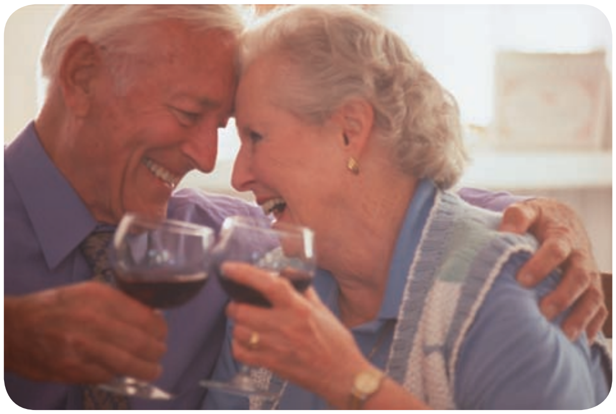


FIGURE **17.16**

AGE AND THE CONSUMPTION OF FIVE OR MORE DRINKS ON AT LEAST ONE DAY IN THE UNITED STATES. The graph shows the considerable decline in having five or more drinks on at least one day as people get older (National Center for Health Statistics, 2002).



What might explain the finding that drinking red wine in moderation is linked to better health and increased longevity?

Late-onset alcoholism is the label used to describe the onset of alcoholism after the age of 65. Late-onset alcoholism is often related to loneliness, loss of a spouse, or a disabling condition.

Recent studies have revealed a protective effect of moderate alcohol use in older adults (Maraldi & others, 2009; Strandberg & others, 2007). One study revealed better physical and mental health, and increased longevity in older adults who drank moderately compared with those who drank heavily or did not drink at all (Rozzini, Ranhoff, & Trabucchi, 2007). The explanation of moderate drinking's benefits involve better physical and mental performance, being more open to social contacts, and being able to assert mastery over one's life.

Researchers have especially found that moderate drinking of red wine is linked to better health and increased longevity (Das, Mukherjee, & Ray, 2010; Queen & Tollefsbol, 2010). Explanation of the benefits of red wine center on its connection to lowering stress and reduced risk of coronary heart disease (Angelone & others, 2010). Evidence is increasing that a chemical in the skin of red wine grapes—resveratrol—plays a key role in red wine's health benefits (Goswami & Das, 2009; Kaeberlein, 2010; Issuree & others, 2009; Marquez, Markus, & Morris, 2010; Park & others, 2009). A recent study found that red wine, but not white, killed several lines of cancer cells (Wallenborg & others, 2009). Scientists are exploring how resveratrol, as well as calorie restriction, increases SIRT1, an enzyme that is involved in DNA repair and aging (Lin & others, 2010; Morselli & others, 2010; Mukherjee & others, 2009).

EXERCISE, NUTRITION, AND WEIGHT

Can exercise slow the aging process? Can eating a nutritious but calorie-reduced diet increase longevity? Let's examine how exercise, nutrition, and weight might influence how healthily we age.

Exercise Although we may be in the evening of our lives in late adulthood, we are not meant to live out our remaining years passively. Everything we know about older adults suggests they are healthier and happier the more active they are.

In one study, exercise literally meant a difference in life or death for middle-aged and older adults. More than 10,000 men and women were divided into categories of low fitness, medium fitness, and high fitness (Blair & others, 1989). Then they were studied over a period of eight years. As shown in Figure 17.17, sedentary participants (low fitness) were more than twice as likely to die during the eight-year time span of the study than those who were moderately fit and more than three times as likely to die as those who were highly fit. The positive effects of being physically fit occurred for both men and women in this study. Further, a recent study revealed that 60-year-old and older adults who were in the lowest fifth in terms of physical fitness as determined by a treadmill test were four times more likely to die over a 12-year period than their counterparts who were in the top fifth of physical fitness (Sui & others, 2007). Also in this study, older adults who were physically fit but overweight had a lower mortality risk over the 12 years than their normal-weight counterparts who were low in fitness (Sui & others, 2007). A longitudinal study found that men who exercised regularly at 72 years of age had a 30 percent higher probability of still being alive at 90 years of age than their sedentary counterparts (Yates & others, 2008). And a recent study of more than 11,000 women found that low cardiorespiratory fitness was a significant predictor of death (Farrell & others, 2010).

Gerontologists increasingly recommend strength training in addition to aerobic activity and stretching for older adults (Peiffer & others, 2010). The average person's lean body mass declines with age—about 6.6 pounds of lean muscle are lost each decade during the adult years. The rate of loss accelerates after age 45. Resistance

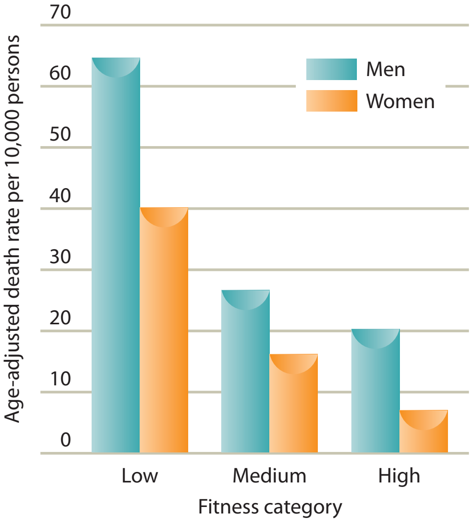


FIGURE **17.17**

PHYSICAL FITNESS AND MORTALITY. In this study of middle-aged and older adults, being moderately fit or highly fit meant that individuals were less likely to die over a period of eight years than their less fit (sedentary) counterparts (Blair & others, 1989).

exercise can preserve and possibly increase muscle mass in older adults (Little & Phillips, 2009; Williamson & others, 2010). A recent meta-analysis revealed that resistance training—especially higher intensity training—was effective in improving older adult's strength and is a viable strategy for reducing muscular weakness associated with aging (Peterson & others, 2010).

Exercise is an excellent way to maintain health. The current recommended level of aerboic activity for adults 60 years of age and older is 30 minutes of moderately intense activity, such as brisk walking or riding a stationary bicycle, five or more days a week, and strength training on two or more days a week (Der Ananian & Prohaska, 2007). Flexibility and balance exercises also are recommended.

Researchers continue to document the positive effects of exercise in older adults. Exercise helps people to live independent lives with dignity in late adulthood (Desai, Grossberg, & Chibnall, 2010). At 80, 90, and even 100 years of age, exercise can help prevent older adults from falling down or even being institutionalized. Being physically fit means being able to do the things you want to do, whether you are young or old. More about research on exercise's positive benefits for health is shown in Figure 17.18.

All we know about older adults indicates that they are healthier and happier the more active they are. Several decades ago, it was believed that older adults should be more passive and inactive to be well adjusted and satisfied with life. In today's world, we believe that while older adults may be in the evening of their life span, they are not meant to live out their remaining years passively.

Researchers who study exercise and aging have discovered the following:

- *Exercise is linked to increased longevity.* In a longitudinal study of Chinese women, those who exercised regularly were less likely to die over approximately a six-year time period (Matthews & others, 2007). A recent study also revealed that systolic blood pressure during exercise was linked to an increase in long-term survival of 75-year-olds (Hedberg & others, 2009). And in one analysis, energy expenditure by older adults during exercise that burns up at least 1,000 calories a week was estimated to increase life expectancy by about 30 percent, while burning up 2,000 calories a week in exercise was estimated to increase life expectancy by about 50 percent (Lee & Skerrett, 2001).
- *Exercise is related to prevention of common chronic diseases.* Exercise can reduce the risk of developing cardiovascular disease, type 2 diabetes, osteoporosis, stroke, and breast cancer (Aizawa & others, 2010; Marks, Katz, & Smith, 2010; Yassine & others, 2009).
- *Exercise is associated with improvement in the treatment of many diseases.* When exercise is used as part of the treatment, individuals with these diseases show improvement in symptoms: arthritis, pulmonary disease, congestive heart failure, coronary artery disease, hypertension, type 2 diabetes, obesity, and Alzheimer disease (Coker & others, 2009; Rimmer & others, 2009).
- *Exercise improves older adults' cellular functioning.* Researchers increasingly are finding that exercise improves cellular functioning in older adults (Boveris & Navarro, 2008). For example, two recent studies revealed that telomere length was greater in leukocytes (white blood cells) when older adults engaged in vigorous aerobic activity (Cherkas & others, 2008; LaRocca, Seals, & Pierce, 2010).
- *Exercise improves immune system functioning in older adults.* A recent study revealed that following exercise, a number of components of immune system functioning in older adult women improved (Sakamoto & others, 2009).
- *Exercise can optimize body composition and reduce the decline in motor skills as aging occurs.* Exercise can increase muscle mass and bone mass, as well as decrease bone fragility (Gu & others, 2009; Maimoun & Sultan, 2010). A recent study

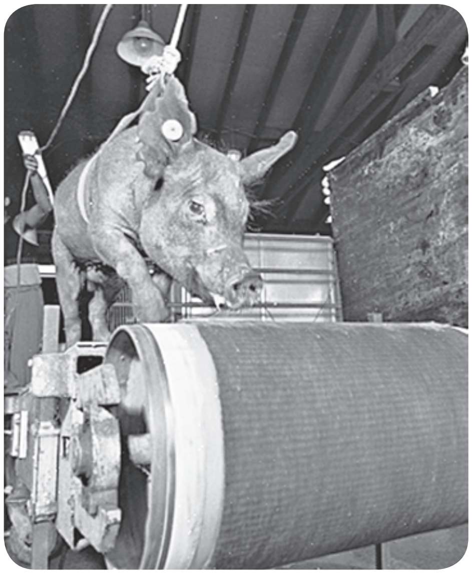


FIGURE **17.18**

THE JOGGING HOG EXPERIMENT. Jogging hogs reveal the dramatic effects of exercise on health. In one investigation, a group of hogs was trained to run approximately 100 miles per week (Bloor & White, 1983). Then, the researchers narrowed the arteries that supplied blood to the hogs' hearts. The hearts of the jogging hogs developed extensive alternate pathways for blood supply, and 42 percent of the threatened heart tissue was salvaged compared with only 17 percent in a control group of nonjogging hogs.

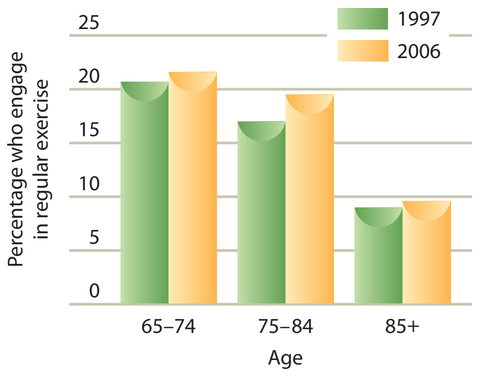


FIGURE **17.19**

REGULAR EXERCISE BY U.S. OLDER ADULTS: 1997 TO 2006

developmental **connection**

Health. Being physically fit and cognitively fit are key aspects of successful aging. Chapter 18, p. 566

found that participation in exercise activities was linked to a delay in the onset and progression of frailty (Peterson & others, 2009).

- *Exercise reduces the likelihood that older adults will develop mental health problems and can be effective in the treatment of mental health problems.* For example, exercise reduces the likelihood that older adults will develop depression and can be effective in treating depression in older adults (Davidson, 2010; Deligiannidis & Freeman, 2010).
- *Exercise is linked to improved brain and cognitive functioning in older adults.* As we saw earlier in the chapter, exercise increases brain volume in older adults (Erickson & others, 2009). Also, exercise increases the information-processing skills of older adults (Williamson & others, 2009).

Despite the extensive documentation of exercise's power to improve older adults' health and quality of life, a recent national survey revealed that older adults have increased their exercise levels only slightly in recent years (Centers for Disease Control and Prevention, 2008) (see Figure 17.19). Possible explanations of older adults' failure to substantially increase their exercise focus on such factors as chronic illnesses, life crises (such as a spouse's death) that disrupt exercise schedules, embarrassment at being around others who are in better shape (especially if they haven't exercised much earlier in life), and the "why bother?" factor (not believing that exercise will improve their lives much) (Painter, 2008). But as we have seen, it is never too late to begin exercising, and older adults can significantly benefit from regular exercise (Farrell & others, 2010; LaRocca, Seals, & Pierce, 2010; Reibis & others, 2010). We will further discuss the influence of exercise on older adults' cognitive functioning in Chapter 18.

Nutrition and Weight Two aspects of undernutrition in older adults especially interest researchers: (1) vitamin and mineral deficiency, and (2) the role of calorie restriction in improving health and extending life.

Some older adults engage in dietary restriction that is harmful to their health, especially when they do not get adequate vitamins and minerals (Cashman & others, 2009; Cheng, Bohr, & de Cabo, 2010; Hamer & others, 2009). One change in eating behavior in older adults is decreased snacking between meals, which may contribute to harmful weight loss, especially in women (Morley, 2003). Among the strategies for increasing weight gain in these women are the use of taste enhancers and of calorie supplements between meals.

Seventeenth-century English philosopher and essayist Francis Bacon was the first author to recommend scientific evaluation of diet and longevity. He advocated a frugal diet. Does a restricted intake of food increase longevity, or could it possibly even extend the human life span?

Scientists have accumulated considerable evidence that caloric restriction (CR) in laboratory animals (in most cases rats) can increase the animals' life span (Marquez, Markus, & Morris, 2010; Minor & others, 2010; Vasunilashorn & Crimmins, 2009). Animals fed diets restricted in calories, although adequate in protein, vitamins, and minerals, live as much as 40 percent longer than animals given unlimited access to food (Jolly, 2005). And chronic problems such as kidney disease appear at a later age (Fernandez, 2008). CR also delays biochemical alterations such as the age-related rise in cholesterol and triglycerides observed in both humans and animals (Fontana, 2009). And recent research indicates that CR may provide neuroprotection for an aging central nervous system (Contestabile, 2009; Opalach & others, 2010) (see Figure 17.20). For example, a recent study revealed that following CR for three months, the verbal memory of older adults improved (Witte & others, 2009).

Why does CR increase the life span of animals? Some scientists argue that CR might lower the level of free radicals and reduce oxidative stress in cells (Lopez-Lluch & others, 2006). Others argue that calorie restriction might trigger a state of emergency called "survival mode" in which the body eliminates all unnecessary functions to focus only on staying alive. This survival mode likely is the result of evolution in which calorie restriction allowed animals to survive periods of famine, and thus the genes remain in the genomes of animal and human species today (Chen & Guarente, 2007).

Whether similar very low-calorie diets can stretch the human life span is not known (Blagosklonny, 2010; Fontana, 2009). In some instances, the animals in these studies ate 40 percent less than normal. In humans, a typical level of calorie restriction involves a 30 percent decrease, which translates into about 1,120 calories a day for the average woman and 1,540 for the average man.

Do underweight women and men live longer lives? A recent study revealed that women who were 20 pounds or more underweight lived longer even after controlling for smoking, hypertension, alcohol intake, and other factors (Wandell, Carlsson, & Theobald, 2009). In this study, underweight men did not live longer when various factors were controlled.

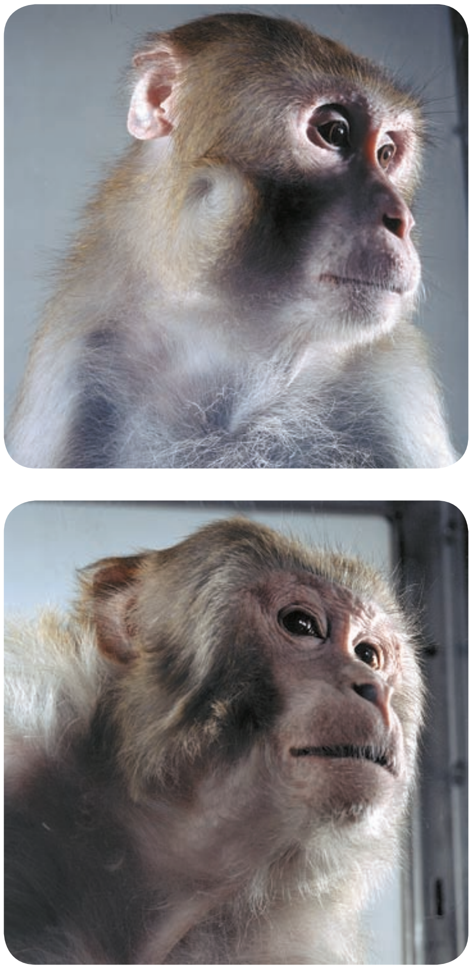


FIGURE **17.20**

CALORIE RESTRICTION IN MONKEYS. Shown here are two male monkeys at the Wisconsin Primate Research Center. Both are 24 years old. The monkey in the top photograph was raised on a calorie-restricted diet, while the monkey in the bottom photograph was raised on a normal diet. Notice that the monkey on the calorie-restricted diet looks younger; he also has lower glucose and insulin levels. The monkey raised on a normal diet has higher triglycerides and more oxidative damage to his cells.

The Controversy Over Vitamins and Aging For years, most experts on aging and health argued that a balanced diet was all that was needed for successful aging; vitamin supplements were not recommended. However, recent research suggests the possibility that some vitamin supplements—mainly a group called "antioxidants," which includes vitamin C, vitamin E, and beta-carotene—help to slow the aging process and improve the health of older adults.

The theory is that antioxidants counteract the cell damage caused by free radicals, which are produced both by the body's own metabolism and by environmental factors such as smoking, pollution, and bad chemicals in the diet (Flora, 2007; Ristow & Zarse, 2010). When free radicals cause damage (oxidation) in one cell, a chain reaction of damage follows. Antioxidants act much like a fire extinguisher, helping to neutralize free-radical activity.

Some research studies find links between the antioxidant vitamins and health. For example, one study linked low blood vitamin C concentration in older adults with an earlier incidence of death (Fletcher, Breeze, & Shetty, 2003). However, recent large-scale studies of men revealed that taking vitamin C and vitamin E did not prevent cardiovascular disease or cancer (Gaziano & others, 2009; Sesso & others, 2008). And another recent study indicated that diet supplementation with vitamins C, E, and beta-carotene had no effect on cancer incidence or cancer death (Lin & others, 2009).

There is no evidence that antioxidants can increase the human life span, but some aging and health experts conclude that vitamin C and beta-carotene can reduce a person's risk of becoming frail and sick in the later adult years (Korantzopoulos & others, 2007). However, there are still a lot of uncertainties in what we know. That is, we don't know which vitamins should be taken, how large a dose should be taken, what the restraints are, and so on. Critics also argue that the key experimental studies documenting the effectiveness of the vitamins in slowing the aging process have not been conducted. The studies in this area thus far have been so-called population studies that are correlational rather than experimental in nature. Other factors—such as exercise, better health practices, and good nutritional habits—might be responsible for the positive findings about vitamins and aging rather than vitamins per se. Also, the free-radical theory is a theory and not a fact, and is only one of a number of theories about why we age.

Possible links between vitamins and cognitive performance in older adults also have been the focus of increased research attention. For example, a recent study revealed that individuals 65 years of age and older who took higher levels of antioxidant vitamins had less cognitive decline than their counterparts who took lower levels (Wengreen & others, 2007). Some studies have found that taking B vitamins—especially folate, B_6, and B_{12}—is positively related to cognitive performance in older adults (Feng & others, 2006). However, other studies indicate that taking B vitamins and other supplemental vitamins has no effect on the cognitive functioning of older adults (McNeill & others, 2007).

HEALTH TREATMENT

The increase in the aging population is predicted to dramatically escalate health care costs over the foreseeable future. As older adults live longer, disease management programs will need to be expanded to handle the chronic disorders of older adults. The increasing health services demand created by the expanding population of older adults is likely to bring shortages of many types of health care professionals, including geriatric nurses, doctors, and health care aides (Curtin, 2007).

What is the quality of health treatment that older adults in the United States receive? A study of older adults with health problems revealed that they receive the recommended medical care they need only half the time (Wenger & others, 2003). The researchers examined the medical records of 372 frail older adults who had been treated by two managed-care organizations over the course of one year. Then they documented the medical care each patient received and judged it using standard indicators of quality. For example, many older adults with an unsteady gait don't get the help they need, such as physical therapy to improve their walking ability. Clearly, the quality of health treatment older adults receive needs to be significantly improved.

Geriatric nurses can be especially helpful in treating the health care problems of older adults. To read about the work of one geriatric nurse, see *Connecting With Careers*.

The development of alternative home and community-based care has decreased the percentage of older adults who live in nursing homes (Katz & others, 2009; Russell & Rice, 2009). Still, as older adults age their probability of being in a nursing home increases (see Figure 17.21). The quality of nursing homes and other extended-care facilities for older adults varies enormously and is a source of continuing national concern (Eskildsen & Price, 2009). More than one-third are seriously deficient. They fail federally mandated inspections because they do not meet the minimum standards for physicians, pharmacists, and various rehabilitation specialists (occupational and physical therapists). Further concerns focus on the patient's right to privacy, access to medical information, safety, and lifestyle freedom within the individual's range of mental and physical capabilities.

Because of the inadequate quality of many nursing homes and the escalating costs for nursing home care, many specialists in the health problems of the aged stress that home health care, elder-care centers, and preventive medicine clinics are good alternatives (Katz & others, 2009). They are potentially less expensive than hospitals and nursing homes. They also are less likely to engender the feelings of depersonalization and dependency that occur so often in residents of institutions. Currently, there is an increased demand for, but shortage of, home-care workers because of the increase in population of older adults and their preference to stay out of nursing homes (Moos, 2007).

In a classic study, Judith Rodin and Ellen Langer (1977) found that an important factor related to health, and even survival, in a nursing home is the patient's feelings of control and self-determination. A group of elderly nursing home residents were encouraged to make more day-to-day

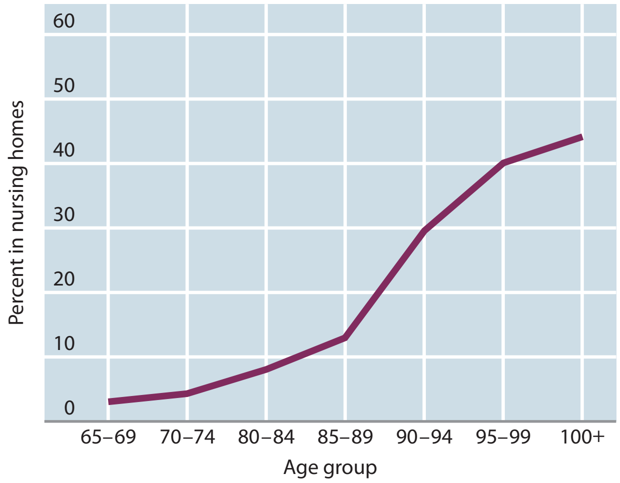


FIGURE **17.21**

PERCENTAGE OF U.S. OLDER ADULTS OF DIFFERENT AGES IN NURSING HOMES

connecting with careers

Sarah Kagan, Geriatric Nurse

Sarah Kagan is a professor of nursing at the University of Pennsylvania School of Nursing. She provides nursing consultation to patients, their families, nurses, and physicians on the complex needs of older adults related to their hospitalization. She also consults on research and the management of patients who have head and neck cancers. Kagan teaches in the undergraduate nursing program, where she directs the course Nursing Care in the Older Adult. In 2003, she was awarded a MacArthur Fellowship for her work in the field of nursing.

In Kagan's own words:

> I'm lucky to be doing what I love—caring for older adults and families—and learning from them so that I can share this knowledge and develop or investigate better ways of caring. My special interests in the care of older adults who have cancer allow me the intimate privilege of being with patients at the best and worst times of their lives. That intimacy acts as a beacon—it reminds me of the value I and nursing as a profession contribute to society and the rewards offered in return (Kagan, 2008, p. 1).

Sarah Kagan with a patient.

For more information about what geriatric nurses do, see page 47 in the Careers in Life-Span Development appendix.

choices and thus feel they had more responsibility for control over their lives. They began to decide such matters as what they ate, when their visitors could come, what movies they saw, and who could come to their rooms. A similar group in the same nursing home was told by the administrator how caring the nursing home was and how much the staff wanted to help, but these residents were given no opportunity to take more control over their lives. Eighteen months later, the residents given responsibility and control were more alert and active, and said they were happier, than the residents who were only encouraged to feel that the staff would try to satisfy their needs. And the "responsible" or "self-control" group had significantly better improvement in their health than did the "dependent" group. Even more important was the finding that after 18 months only half as many nursing home residents in the "responsibility" group had died as in the "dependent" group (see Figure 17.22). Perceived control over one's environment, then, can literally be a matter of life or death.

In another research study, Rodin (1983) measured stress-related hormones in several groups of nursing home residents. Then she taught the residents coping skills to help them deal better with day-to-day problems. They were taught how to say no when they did not want something, without worrying whether they would offend someone. They were given assertiveness training and learned time-management skills. After the training, the nursing home residents had greatly reduced levels of cortisol (a hormone closely related to stress that has been implicated in a number of diseases). The cortisol levels of the assertiveness-training residents remained lower, even after 18 months. Further, these nursing home residents were healthier and had a reduced need for medication, compared with residents who had not been taught the coping skills.

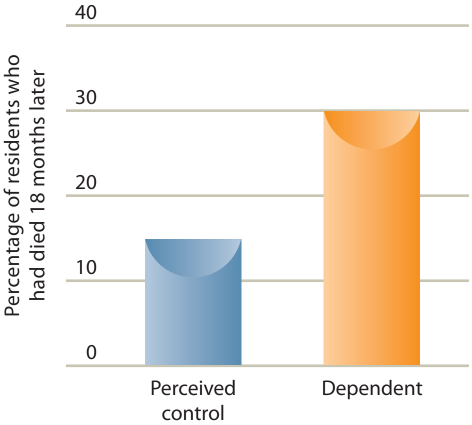


FIGURE **17.22**

PERCEIVED CONTROL AND MORTALITY. In the study by Rodin and Langer (1977), nursing home residents who were encouraged to feel more in control of their lives were more likely to be alive 18 months later than those who were treated to feel more dependent on the nursing home staff.

connecting development to life

Health Care Providers and Older Adults

The attitudes of both the health care provider and the older adult are important aspects of the older adult's health care (Aud & others, 2006; Miller, 2010). Unfortunately, health care providers too often share society's stereotypes and negative attitudes toward older adults (Reyna, Goodwin, & Ferrari, 2007; Rovi & others, 2009). In a health care setting, these attitudes can take the form of avoidance, dislike, and begrudged tolerance rather than positive, hopeful treatment. Health care personnel are more likely to be interested in treating younger persons, who more often have acute problems with a higher prognosis for successful recovery. They often are less motivated to treat older persons, who are more likely to have chronic problems with a lower prognosis for successful recovery.

Not only are physicians less responsive to older patients, but older patients often take a less active role in medical encounters with health care personnel than do younger patients. Older adults should be encouraged to take a more active role in their own health care.

What aspect of Judith Rodin's coping skills training (discussed just before this interlude) might help older patients in obtaining adequate health care?

Mathilde Spett (*right*), who is 91 years old, injured herself in a fall but recently graduated from a walker to a cane and learned how to stay on a better diet with the help of home-care aide, Marilyn Ferguson (*left*). The demand for home-care aides is predicted to increase dramatically in the next several decades because of the likely doubling of the 65-year and older population and older adults' preference for remaining out of nursing homes (Moos, 2007). It is not only important to significantly increase the number of health care professionals to treat older adults, it is also very important that they not harbor negative stereotypes of older adults and that they show very positive attitudes toward them.

Rodin's research shows that simply giving nursing home residents options for control and teaching them coping skills can change their behavior and improve their health. To read further about health care providers and older adults, see *Connecting Development to Life*.

Review *Connect* Reflect

LG3 Identify health problems in older adults and how they can be treated.

Review

- What are some common health problems in older adults? What are the main causes of death in older adults?
- What characterizes substance abuse in late adulthood?
- How do exercise, nutrition, and weight influence development in late adulthood?
- What are some options and issues in the health treatment of older adults?

Connect

- In this section, we learned that older adults fare better when they are given more responsibility and control in their lives. At what other age stages is giving individuals more responsibility and control particularly important for their development? In what way(s)?

Reflect *Your Own Personal Journey of Life*

- What changes in your lifestyle now might help you age more successfully when you become an older adult?

topical **connections**

Eventually, the human life span ends with death. Compared to younger adults and children, most older adults are closer to death and more likely to know that they will die gradually over a period of time rather than suddenly. Physical impairments—such as cardiovascular disease and cancer—are the most likely reasons older adults will die. Actual death is sometimes difficult to determine and involves which portions of the brain are no longer functioning. Care for the dying often involves providing comfort and managing pain.

looking ***forward***

reach your **learning goals**

Physical Development in Late Adulthood

1 Longevity

LG1 Characterize longevity and the biological theories of aging.

Life Expectancy and Life Span

- Life expectancy refers to the number of years that will probably be lived by an average person born in a particular year. Life span is the maximum number of years an individual can live. Life expectancy has dramatically increased; life span has not. An increasing number of individuals live to be 100 or older. Genetics, health, and coping well with stress can contribute to becoming a centenarian. On the average, females live about six years longer than males do. The sex difference is likely due to biological and social factors.

The Young-Old, the Old-Old, and the Oldest-Old

- In terms of chronological age, the young-old have been described as being 65 to 74 years of age, the old-old as 75 years and older, and the oldest-old as 85 years and older. Many experts on aging prefer to describe the young-old, old-old, and oldest-old in terms of functional age rather than chronological age. This view accounts for the fact that some 85-year-olds are more biologically and psychologically fit than some 65-year-olds. However, those 85 and older face significant problems, whereas those in their sixties and seventies are experiencing an increase in successful aging.

Biological Theories of Aging

- Five biological theories are evolutionary theory, cellular clock theory, free-radical theory, mitochondrial theory, and hormonal stress theory. The evolutionary theory of aging proposes that natural selection has not eliminated many harmful conditions and nonadaptive characteristics in older adults; thus, the benefits conferred by evolutionary theory decline with age because natural selection is linked to reproductive fitness. Hayflick proposed the cellular clock theory, which states that cells can divide a maximum of about 75 to 80 times, and that as we age, our cells become less capable of dividing. Telomeres are likely involved in explaining why cells lose their capacity to divide. According to free-radical theory, people age because unstable oxygen molecules called free radicals are produced in the cells and damage cellular structures. According to mitochondrial theory, aging is due to the decay of mitochondria, tiny cellular bodies that supply energy for function, growth, and repair. According to hormonal stress theory, aging in the body's hormonal system can lower resilience to stress and increase the likelihood of disease.

2 The Course of Physical Development in Late Adulthood

LG2 Describe how a person's brain and body change in late adulthood.

The Aging Brain

- The brain loses weight and volume with age, and there is a general slowing of function in the central nervous system that begins in middle adulthood and increases in late adulthood. However, researchers have recently found that older adults can generate new neurons, and at least through the seventies, new dendrites. The aging brain retains considerable plasticity and adaptiveness. For example, it may compensate for losses in some regions of the brain by shifting responsibilities to other regions. A decrease in lateralization may reflect this kind of compensation, or it may reflect an age-related decline in the specialization of function.

The Immune System

- Decline in immune system functioning with aging is well documented. Exercise can improve immune system functioning.

Physical Appearance and Movement

- The most obvious signs of aging are wrinkled skin and age spots on the skin. People get shorter as they age, and their weight often decreases after age 60 because of loss of muscle. The movement of older adults slows across a wide range of movement tasks.

Sensory Development

- Declines in visual acuity, color vision, and depth perception usually occur with age, especially after age 75. The yellowing of the eye's lens with age reduces color differentiation. The ability to see the periphery of a visual field also declines in older adults. Significant declines in visual functioning related to glare characterize adults 75 years and older and even more so for those 85 and older. Three diseases that can impair the vision of older adults are cataracts, glaucoma, and macular degeneration. Hearing decline can begin in middle age but usually does not become much of an impediment until late adulthood. Hearing aids (for conductive hearing loss) and cochlear implants (for neurosensory hearing loss) can diminish hearing problems for many older adults. Smell and taste can decline, although the decline is minimal in healthy older adults. Changes in touch sensitivity are associated with aging, although this does not present a problem for most older adults. Sensitivity to pain decreases in late adulthood.

The Circulatory System and Lungs

- Cardiovascular disorders increase in late adulthood. Consistent high blood pressure should be treated to reduce the risk of stroke, heart attack, and kidney disease. Lung capacity does drop with age, but older adults can improve lung functioning with diaphragm-strengthening exercises.

Sexuality

- Aging in late adulthood does include some changes in sexual performance, more for males than females. Nonetheless, there are no known age limits to sexual activity.

3 Health

LG3 Identify health problems in older adults and how they can be treated.

Health Problems

- As we age, our probability of disease or illness increases. Chronic disorders are rare in early adulthood, increase in middle adulthood, and become more common in late adulthood. The most common chronic disorder in late adulthood is arthritis. Nearly three-fourths of older adults die of cancer, heart disease, or stroke. Osteoporosis is the main reason many older adults walk with a stoop; women are especially vulnerable. Accidents are usually more debilitating to older than to younger adults.

Substance Use and Abuse

- Alcohol use and abuse declines in older adults, although this is more difficult to detect in older adults than in younger adults.

Exercise, Nutrition, and Weight

- The physical benefits of exercise have clearly been demonstrated in older adults. Aerobic exercise and weight lifting are both recommended if the adults are physically capable of them. There is concern about older adults who do not get adequate vitamins and minerals, especially women. Caloric restriction (CR) in animals can increase the animals' life span, but whether this works with humans is not known. In humans, being overweight is associated with an increased mortality rate. Most nutritional experts recommend a well-balanced, low-fat diet for older adults, but do not recommend an extremely low-calorie diet. Controversy surrounds the question of whether vitamin supplements—especially the antioxidants vitamin C, vitamin E, and beta-carotene—can slow the aging process and improve older adults' health. Recent research has found a link between taking B vitamins and positive cognitive performance in older adults.

Health Treatment

- Although only 3 percent of adults over 65 reside in nursing homes, 23 percent of adults 85 and over do. The quality of nursing homes varies enormously. Alternatives to nursing homes are being proposed. Simply giving nursing home residents options for control and teaching coping skills can change their behavior and improve their health. The attitudes of both the health care provider and the older adult patient are important aspects of the older adult's health care. Too often health care personnel share society's negative view of older adults.

key **terms**

life span 532
life expectancy 532
evolutionary theory of aging 537
cellular clock theory 537
free-radical theory 537
mitochondrial theory 538
hormonal stress theory 538
neurogenesis 540
cataracts 545
glaucoma 545
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key **people**

Leonard Hayflick 537
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chapter 18 COGNITIVE DEVELOPMENT IN LATE ADULTHOOD

chapter **outline**

1 Cognitive Functioning in Older Adults

Learning Goal 1 Describe the cognitive functioning of older adults.

Multidimensionality and Multidirectionality
Education, Work, and Health
Use It or Lose It
Training Cognitive Skills
Cognitive Neuroscience and Aging

2 Language Development

Learning Goal 2 Characterize changes in language in older adults.

3 Work and Retirement

Learning Goal 3 Discuss aging and adaptation to work and retirement.

Work
Retirement in the United States and in Other Countries
Adjustment to Retirement

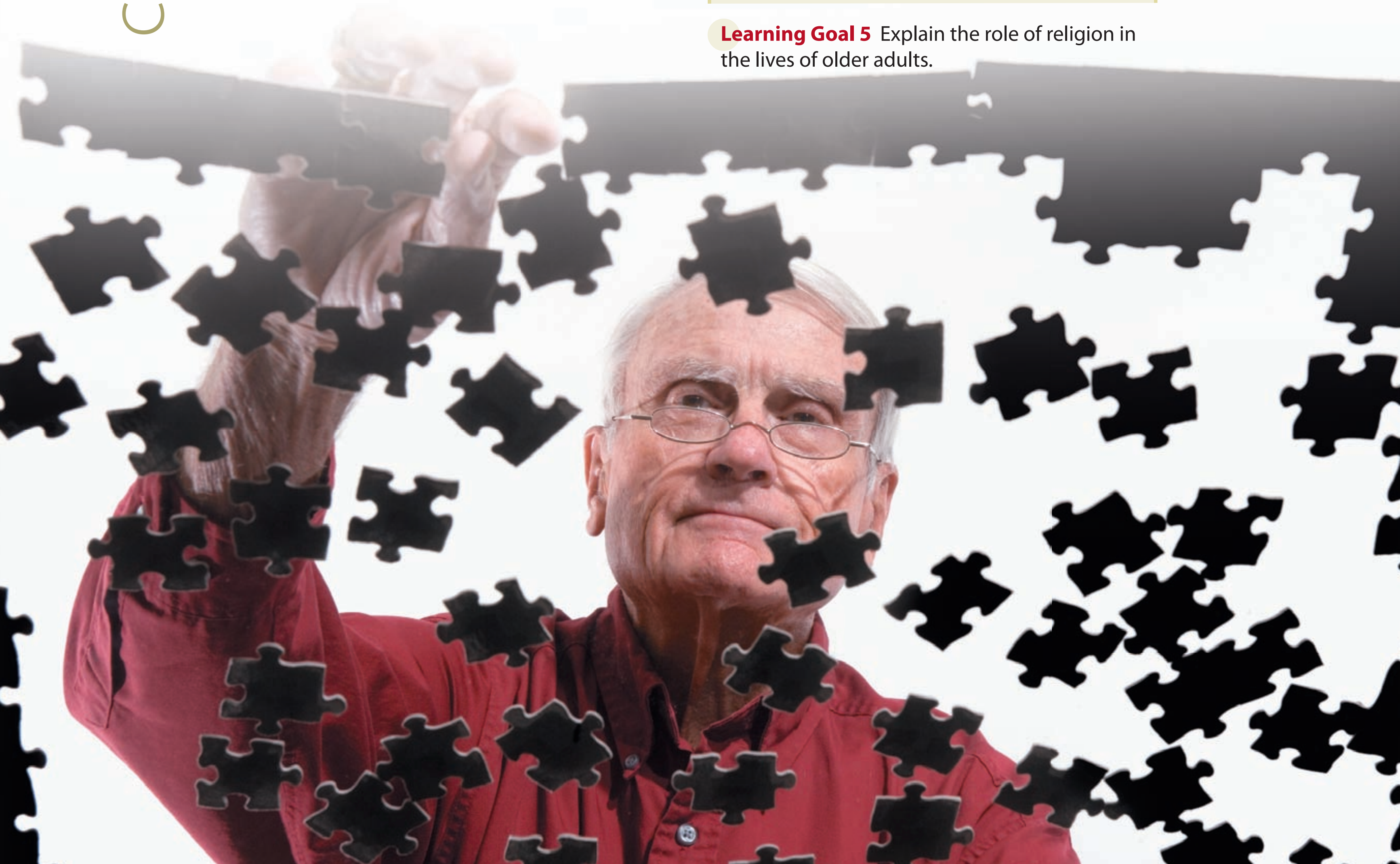
4 Mental Health

Learning Goal 4 Describe mental health problems in older adults.

Depression
Dementia, Alzheimer Disease, and Other Afflictions
Fear of Victimization, Crime, and Elder Maltreatment

5 Religion

Learning Goal 5 Explain the role of religion in the lives of older adults.



In 2010, 90-year-old Helen Small completed her master's degree at the University of Texas at Dallas (UT-Dallas). The topic of her master's degree research project was romantic relationships in late adulthood. Helen said that she only interviewed one individual who was older than she was—a 92-year-old man.

I (your author, John Santrock) first met Helen when she took my undergraduate course in life-span development in 2006. After the first test, Helen stopped showing up and I wondered what had happened to her. It turns out that she had broken her shoulder when she tripped over a curb while hurrying to class. The next semester, she took my class again and did a great job in it, even though the first several months she had to take notes with her left hand (she's right-handed) because of her lingering shoulder problem.

Helen grew up in the Great Depression and first went to college in 1938 at the University of Akron, where she only attended for one year. She got married and her marriage lasted 62 years. After her husband's death, Helen went back to college in 2002, first at Brookhaven Community College and then at UT-Dallas. When I interviewed her recently, she told me that she had promised her mother that she would finish college. Her most important advice for college students, "Finish college and be persistent. When you make a commitment, always see it through. Don't quit. Go after what you want in life."

Helen Small with the author of your text, John Santrock, in his undergraduate course on life-span development at the University of Texas at Dallas in spring 2010.

Helen not only is cognitively fit, she also is physically fit. She works out three times a week for about an hour each time—aerobically on a treadmill for about 30 minutes and then on six different weight machines.

What struck me most about Helen when she took my undergraduate course in life-span development was how appreciative she was of the opportunity to learn and how tenaciously she pursued studying and doing well in the course. Helen was quite

topical **connections**

Most individuals reach the peak of their cognitive functioning in middle adulthood. However, some cognitive processes increase while others decline in middle age. For example, vocabulary peaks and speed of processing decreases in middle age. Expertise also typically increases during this adult age period. For many people, midlife is a time when individuals reflect and evaluate their current work and what they plan to do in the future. Many middle-aged adults increasingly examine life's meaning.

looking ***back***

popular with the younger students in the course and she was a terrific role model for them.

After her graduation, I asked her what she planned to do the next few years and she responded, "I've got to figure out what I'm going to do with the rest of my life. I'm going to audit some college classes and I'm looking into teaching a college course at UT-Dallas for elderly adults." I recently invited Helen to the cognitive development and aging lecture in my life-span course in spring 2010, to talk with the students about her life and experiences. She wowed the class and has been an inspiration to all who come in contact with her. I plan to continue to have her come and talk to my classes in the future.

preview

Helen Small leads a very active cognitive life as an older adult. Just how well older adults can and do function cognitively is an important question we will explore in this chapter. We also will examine the important topics of language development, work and retirement, mental health, and religion.

1 Cognitive Functioning in Older Adults

LG1 Describe the cognitive functioning of older adults.

- Multidimensionality and Multidirectionality
- Education, Work, and Health
- Use It or Lose It
- Training Cognitive Skills
- Cognitive Neuroscience and Aging

Grandma Moses, known in her time as the "grand old lady of American art," took up painting at the age of 76 and continued to paint past her 100th birthday.

At age 76, Anna Mary Robertson Moses, better known as Grandma Moses, took up painting and became internationally famous, staging 15 one-woman shows throughout Europe. At age 89, Arthur Rubinstein gave one of his best performances at New York's Carnegie Hall. When Pablo Casals was 95, a reporter asked him, "Mr. Casals, you are the greatest cellist who ever lived. Why do you still practice six hours a day?" Mr. Casals replied, "Because I feel like I am making progress" (Canfield & Hansen, 1995).

MULTIDIMENSIONALITY AND MULTIDIRECTIONALITY

In thinking about the nature of cognitive change in adulthood, it is important to consider that cognition is a multidimensional concept (Margrett & Deshpande-Kamat, 2009). It is also important to consider that, although some dimensions of cognition might decline as we age, others might remain stable or even improve.

Cognitive Mechanics and Cognitive Pragmatics Paul Baltes (2003; Baltes, Lindenberger, & Staudinger, 2006) clarified the distinction between those aspects of the aging mind that show decline and those that remain stable or even improve:

- **Cognitive mechanics** are the "hardware" of the mind and reflect the neurophysiological architecture of the brain developed through evolution. Cognitive mechanics consist of these components: speed and accuracy of the processes involved in sensory input, attention,

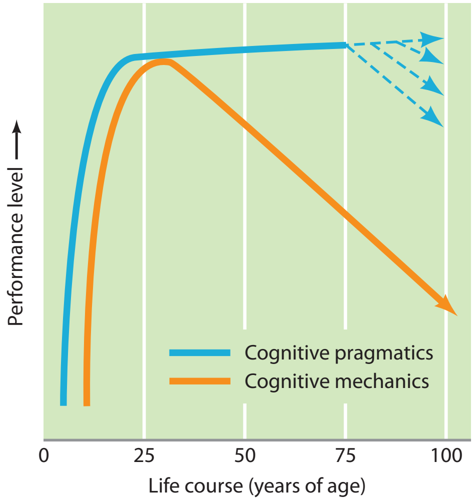


FIGURE **18.1**

THEORIZED AGE CHANGES IN COGNITIVE MECHANICS AND COGNITIVE PRAGMATICS. Baltes argues that cognitive mechanics decline during aging, whereas cognitive pragmatics do not, at least for many people until they become very old. Cognitive mechanics have a biological/genetic foundation; cognitive pragmatics have an experiential/cultural foundation. The broken lines from 75 to 100 years of age indicate possible individual variations in cognitive pragmatics.

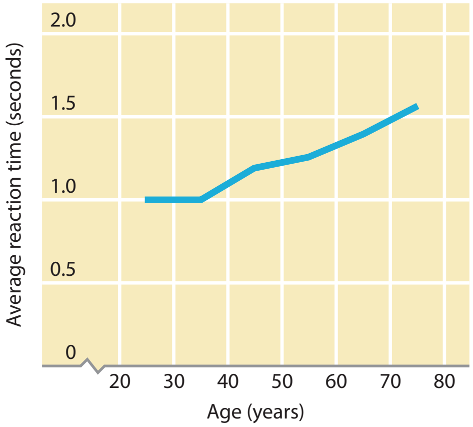


FIGURE **18.2**

THE RELATION OF AGE TO REACTION TIME. In one study, the average reaction time began to slow in the forties, and this decline accelerated in the sixties and seventies (Salthouse, 1994). The task used to assess reaction time required individuals to match numbers with symbols on a computer screen.

visual and motor memory, discrimination, comparison, and categorization. Because of the strong influence of biology, heredity, and health on cognitive mechanics, their decline with aging is likely. Some researchers conclude that the decline in cognitive mechanics may begin as soon as early midlife (Finch, 2009; Salthouse, 2009).

- **Cognitive pragmatics** are the culture-based "software programs" of the mind. Cognitive pragmatics include reading and writing skills, language comprehension, educational qualifications, professional skills, and also the type of knowledge about the self and life skills that help us to master or cope with life. Because of the strong influence of culture on cognitive pragmatics, their improvement into old age is possible. Thus, although cognitive mechanics may decline in old age, cognitive pragmatics may actually improve, at least until individuals become very old (see Figure 18.1).

The distinction between cognitive mechanics and cognitive pragmatics is similar to the one between fluid (mechanics) and crystallized (pragmatics) intelligence that was described in Chapter 15. Indeed, the similarity is so strong that some experts now use these terms to describe cognitive aging patterns: *fluid mechanics* and *crystallized pragmatics* (Lovden & Lindenberg, 2007).

What factors are most likely to contribute to the decline in fluid mechanics in late adulthood? Among the most likely candidates are declines in processing speed, working memory capacity, and suppressing irrelevant information (inhibition) (Lovden & Lindenberg, 2007).

Now that we have examined the distinction between fluid mechanics and crystallized pragmatics, let's explore some of the more specific cognitive processes that reflect these two general domains, beginning with this aspect of cognitive mechanics: speed of processing.

Speed of Processing It is now well accepted that the speed of processing information declines in late adulthood (Salthouse, 2009). Figure 18.2 illustrates this decline through the results of a study or slowing reaction times in adults.

Although speed of processing information slows down in late adulthood, there is considerable individual variation in this ability. Accumulated knowledge may compensate to some degree for slower processing speed in older adults.

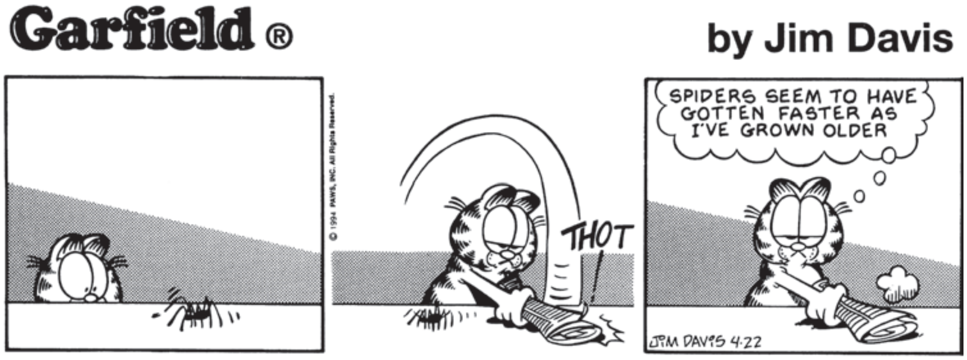
The decline in processing speed in older adults is likely due to a decline in functioning of the brain and central nervous system (Finch, 2009). Health and exercise may influence how much decline in processing speed occurs. For example, one study found that following six months of aerobic exercise older adults showed improvement on reaction time tasks (Kramer & others, 1999).

developmental **connection**

Intelligence. Fluid intelligence is the ability to reason abstractly; crystallized intelligence is an individual's accumulated information and verbal skills. Chapter 15, p. 488

cognitive mechanics The "hardware" of the mind, reflecting the neurophysiological architecture of the brain. Cognitive mechanics involve the speed and accuracy of the processes involving sensory input, visual and motor memory, discrimination, comparison, and categorization.

cognitive pragmatics The culture-based "software programs" of the mind. Cognitive pragmatics include reading and writing skills, language comprehension, educational qualifications, professional skills, and also the type of knowledge about the self and life skills that help us to master or cope with life.


Garfield®
by Jim Davis
THOT
SPIDERS SEEM TO HAVE GOTTEN FASTER AS I'VE GROWN OLDER
JIM DAVIS 4-22

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Attention Changes in attention are important aspects of cognitive aging (Commodari & Guarnera, 2008). Three aspects of attention that have been investigated in older adults are selective attention, divided attention, and sustained attention:

- **Selective attention** is focusing on a specific aspect of experience that is relevant while ignoring others that are irrelevant. An example of selective attention is the ability to focus on one voice among many in a crowded room or a noisy restaurant. Another is making a decision about which stimuli to attend to when making a left turn at an intersection. Generally, older adults are less adept at selective attention than younger adults are (Bucur & Madden, 2007). However, on simple tasks involving a search for a feature, such as determining whether a target item is present on a computer screen, age differences are minimal when individuals are given sufficient practice.

What types of attention have been studied in older adults? What are some developmental changes in these types of attention?

- **Divided attention** involves concentrating on more than one activity at the same time. When the two competing tasks are reasonably easy, age differences among adults are minimal or nonexistent. However, the more difficult the competing tasks are, the less effectively older adults divide attention than younger adults (Bucur & Madden, 2007). In one study, the ability to engage in a conversation while simultaneously driving a simulator through highway traffic (in an experimental laboratory) was examined in 17- to 25-year-olds, 26- to 49-year-olds, and 50- to 80-year-olds (McKnight & McKnight, 1993). A nondistraction control condition also was included. Overall, the participants performed more poorly in the divided attention condition than in the nondistraction control condition. Also, the older adults (50 to 80 years old) performed worse in the divided attention condition than the younger two groups but not in the control condition. Thus, placing more demands on the attention of the older adults led them to perform more poorly on the driving task.
- **Sustained attention** is focused and extended engagement with an object, task, event, or some other aspect of the environment. Sometimes sustained attention is referred to as *vigilance*. On tests of simple vigilance older adults usually perform as well as younger adults, but on complex vigilance tasks older adults' performance usually drops (Bucur & Madden, 2007). And a recent study revealed that older adults showed less effective decision making on a complex laboratory task that required sustained attention than did younger adults (Isella & others, 2008).

developmental **connection**

Attention. Executive attention is a type of attention that has recently been studied in young children. Chapter 7, p. 224

selective attention Focusing on a specific aspect of experience that is relevant while ignoring others that are irrelevant.

divided attention Concentrating on more than one activity at the same time.

sustained attention Focused and extended engagement with an object, task, event, or other aspect of the environment.

Memory Let's examine a research study that addresses how we remember as we age. Non-Latino adults of various ages in the United States were studied to determine how much Spanish they remembered from classes they had taken in high school or college (Bahrick, 1984). The individuals chosen for the study had used

Spanish very little since they initially learned it in high school or college. Not surprisingly, the young adults who had taken Spanish within the last three years remembered Spanish best. After that, the deterioration in memory was gradual (see Figure 18.3). For example, older adults who had studied Spanish 50 years earlier remembered about 80 percent of what young adults did who had studied it in the last three years! The most important factor in the adults' memory of Spanish was not how long ago they studied it but how well they initially learned it—those who got an A in Spanish 50 years earlier remembered more Spanish than adults who got a C when taking Spanish only one year earlier.

Memory does change during aging, but not all memory changes with age in the same way (Barba, Attali, & La Corte, 2010). The main dimensions of memory and aging that have been studied include episodic memory, semantic memory, cognitive resources (such as working memory and perceptual speed), memory beliefs, source memory, prospective memory, and noncognitive factors such as health, education, and socioeconomic factors.

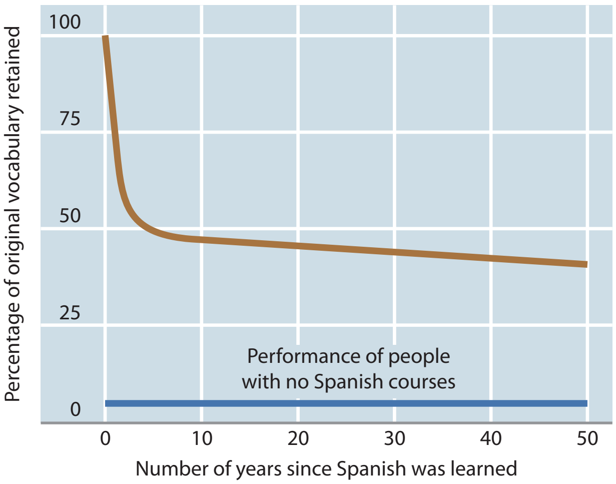


FIGURE **18.3**

MEMORY FOR SPANISH AS A FUNCTION OF AGE SINCE SPANISH WAS LEARNED. An initial steep drop over about a three-year period in remembering the vocabulary learned in Spanish classes occurred. However, there was little dropoff in memory for Spanish vocabulary from three years after taking Spanish classes to 50 years after taking them. Even 50 years after taking Spanish classes, individuals still remembered almost 50 percent of the vocabulary.

Episodic Memory **Episodic memory** is the retention of information about the where and when of life's happenings. For example, what was it like when your younger sister or brother was born, what happened to you on your first date, what were you doing when you heard that airplanes had struck the World Trade Center, and what did you eat for breakfast this morning?

Younger adults have better episodic memory than older adults have (Cansino, 2009). A recent study of 18- to 94-year-olds revealed that increased age was linked to increased difficulty in retrieving episodic information, facts, and events (Siedlecki, 2007). Also, older adults think that they can remember older events better than more recent events, typically reporting that they can remember what happened to them years ago but can't remember what they did yesterday. However, researchers consistently have found that, contrary to such self-reports, in older adults the older the memory, the less accurate it is. This has been documented in studies of memory for high school classmates, foreign language learned in school over the life span, names of grade school teachers, and autobiographical facts kept in diaries (Smith, 1996).

Semantic Memory **Semantic memory** is a person's knowledge about the world. It includes a person's fields of expertise, such as knowledge of chess for a skilled chess player; general academic knowledge of the sort learned in school, such as knowledge of geometry; and "everyday knowledge" about the meanings of words, famous individuals, important places, and common things, such as what day is Valentine's Day. Semantic memory appears to be independent of an individual's personal identity with the past. For example, you can access a fact—such as "Lima is the capital of Peru"—and not have the foggiest idea of when and where you learned it.

Does semantic memory decline during aging? Among the tasks that researchers often use to assess semantic memory are vocabulary, general knowledge, and word identification (Bucur & Madden, 2007). Older adults do often take longer to retrieve semantic information, but usually they can ultimately retrieve it. However, the ability to retrieve very specific information (such as names) usually declines in older adults (Luo & Craik, 2008). For the most part, episodic memory declines more than semantic memory in older adults (Yoon, Cole, & Lee, 2009).

Although many aspects of semantic memory are reasonably well preserved in late adulthood, a common memory problem for older adults is the *tip-of-the-tongue (TOT) phenomenon*, in which individuals can't quite retrieve familiar information but have the feeling that they should be able to retrieve it (Bucur & Madden, 2007). Researchers have found that older adults are more likely to be experience TOT states than younger adults (Bucur & Madden, 2007).

episodic memory The retention of information about the where and when of life's happenings.

semantic memory A person's knowledge about the world—including a person's fields of expertise, general academic knowledge of the sort learned in school, and "everyday knowledge."

developmental **connection**

Memory. Working memory begins to decline in late middle age and continues to decline in late adulthood. Chapter 15, p. 491

Cognitive Resources: Working Memory and Perceptual Speed One view of memory suggests that a limited number of cognitive resources can be devoted to any cognitive task. Two important cognitive resource mechanisms are working memory and perceptual speed. Recall from Chapter 15 that *working memory* is closely linked to short-term memory but places more emphasis on memory as a place for mental work. Working memory is like a mental "workbench" that allows individuals to manipulate and assemble information when making decisions, solving problems, and comprehending written and spoken language (Baddeley, 2007a, b). Researchers have found declines in working memory during the late adulthood years (Delaloye & others, 2009). Explanation of the decline in working memory in older adults focuses on their less efficient inhibition in preventing irrelevant information from entering working memory and their increased distractability (Commodari & Guarnera, 2008; Lusting & Hasher, 2009).

Perceptual speed is another cognitive resource that has been studied by researchers on aging (Deary, Johnson, & Starr, 2010; Salthouse, 2009). Perceptual speed is the ability to perform simple perceptual-motor tasks such as deciding whether pairs of two-digit or two-letter strings are the same or different or determining the time required to step on the brakes when the car directly ahead stops. Perceptual speed shows considerable decline in late adulthood, and it is strongly linked with decline in working memory (Bopp & Verhaeghen, 2007). A recent study revealed that trial-to-trial variability in perceptual speed on a reaction time task signaled impending decline in cognitive performance in older adults (Lovden & others, 2007).

Explicit and Implicit Memory Researchers also have found that aging is linked with a decline in explicit memory (Yoon, Cole, & Lee, 2009). **Explicit memory** is memory of facts and experiences that individuals consciously know and can state. Explicit memory also is sometimes called *declarative memory.* Examples of explicit memory include being at a grocery store and remembering what you wanted to buy, being able to name the capital of Illinois, or recounting the events of a movie you have seen. **Implicit memory** is memory without conscious recollection; it involves skills and routine procedures that are automatically performed. Examples of implicit memory include driving a car, swinging a golf club, or typing on a computer keyboard, without having to consciously think about it.

Implicit memory is less likely to be adversely affected by aging than explicit memory (Howard & others, 2008). Thus, older adults are more likely to forget what items they wanted to buy at a grocery store (unless they write them down on a list and take it with them) than they are to forget how to drive a car. Their perceptual speed might be slower in driving the car, but they remember how to do it.

This older adult woman has forgotten where the keys to her car are. *What type of memory is involved in this situation?*

Source Memory **Source memory** is the ability to remember where one learned something. Failures of source memory increase with age in the adult years and they can create awkward situations, as when an older adult forgets who told a joke and retells it to the source (Besken & Gulgoz, 2009; Glisky & Kong, 2009).

Lynn Hasher (2003, p. 1301) argues that age differences are substantial in many studies of memory, such as resource memory, when individuals are asked "for a piece of information that just doesn't matter much. But if you ask for information that is important, old people do every bit as well as young adults . . . young people have mental resources to burn. As people get older, they get more selective in how they use their resources."

Prospective Memory **Prospective memory** involves remembering to do something in the future, such as remembering to take your medicine or remembering to do an errand. Although some researchers have found a decline in prospective memory with age, a number of studies show that whether there is a decline is complex and depends on such factors as the nature of the task, what is being assessed, and the context of the assessment (Einstein & McDaniel, 2005; Rendell & others, 2007). For example, age-related deficits occur more often in time-based (such as remembering to call someone next Friday) than in event-based (remembering to tell your friend

explicit memory Memory of facts and experiences that individuals consciously know and can state.

implicit memory Memory without conscious recollection; involves skills and routine procedures that are automatically performed.

source memory The ability to remember where one learned something.

prospective memory Remembering to do something in the future.

to read a particular book the next time you see her) prospective memory tasks. Further, declines in prospective memory occur more in laboratory than real-life settings (Bisiacchi, Tarantino, & Ciccola, 2008). Indeed, in some real-life settings, such as keeping appointments, older adults' prospective memory is better than younger adults' (Luo & Craik, 2008).

Prospective memory involves remembering to do something in the future. The older adult woman here is keeping track of what she plans to buy when she goes to a grocery store the next day.

Beliefs, Expectations, and Feelings Some studies have found that older adults' beliefs and expectancies about memory play a role in their actual memory (Lineweaver, Berger, & Hertzog, 2009; McDougall, 2009). It matters what people tell themselves about their ability to remember. Older adults' positive or negative beliefs or expectancies about their memory skills are related to their actual memory performance (Hess & Hinson, 2006). Consider a study in which older adults were randomly assigned to read one of two mock newspaper articles at the beginning of a testing situation (Hess & others, 2003). One described the declines in memory that characterize aging; the other emphasized research on the preservation of memory skills in older adults. The older adults who read the pessimistic account of memory and aging remembered 20 to 30 percent fewer words than people who read about the ability to maintain memory in old age.

Attitudes and feelings also matter (Reese & Cherry, 2004). One study found that individuals with low anxiety about their memory skills and high self-efficacy regarding their use of memory in everyday contexts had better memory performance than their high-anxiety/low-self-efficacy counterparts (McDougall & others, 1999).

Noncognitive Factors Health, education, and socioeconomic status (SES) can influence an older adult's performance on memory tasks (Fritsch & others, 2007; Lachman & others, 2010; Noble & others, 2010). Although such noncognitive factors as good health are associated with less memory decline in older adults, they do not eliminate memory decline. A recent study revealed that older adults with less education had lower cognitive abilities than those with more education (Lachman & others, 2010). However, for older adults with less education, frequently engaging in cognitive activities improved their episodic memory.

One criticism of research on memory and aging is that it has relied primarily on laboratory tests of memory. The argument is that such tasks are contrived and do not represent the everyday cognitive tasks performed by older adults. If researchers used more everyday life memory tasks, would memory decline be found in older adults? A number of researchers have found that using more familiar tasks reduces age decrements in memory but does not eliminate them. Younger adults are better than older adults at remembering faces, routes through town, grocery items, and performed activities. In one study, younger adults (20 to 40 years old) remembered news content in print, audio, and TV format better than older adults (60 to 80 years old) did (Frieske & Park, 1999).

Conclusions About Memory and Aging Some, but not all, aspects of memory decline in older adults (Healey & Hasher, 2009). The decline occurs primarily in episodic and working memory, not in semantic memory or implicit memory. A decline in perceptual speed is associated with memory decline (Salthouse, 2009). Successful aging does not mean eliminating memory decline, but does mean reducing it and adapting to it. As we will see later in this chapter, older adults can use certain strategies to reduce memory decline.

Does the time of day an older adult's or a younger adult's memory is tested affect the results? To find out, read *Connecting Through Research* on the next page.

Decision Making Despite declines in many aspects of memory, such as working memory and long-term memory, many older adults preserve decision-making skills reasonably well (Healey & Hasher, 2009). In some cases, though, age-related decreases

connecting through research

Does the Time of Day an Older Adult's or a Younger Adult's Memory Is Tested Affect the Results?

Certain testing conditions may have exaggerated memory declines in older adults (Yoon & others, 2010). Most researchers conduct their studies in the afternoon, a convenient time for researchers and undergraduate participants. Traditional-age college students in their late teens and early twenties are often more alert and function more optimally in the afternoon but approximtely 75 percent of older adults are "morning persons," performing their best early in the day (Helmuth, 2003).

Lynn Hasher and her colleagues (2001) tested the memory of college students 18 to 32 years of age and community volunteers 58 to 78 years of age in the late afternoon (about 4 p.m. to 5 p.m.) and in the morning (about 8 a.m. to 9 a.m.). Regardless of the time of day, the younger college students performed better than the older adults on the memory tests, which involved recognizing sentences from a story and memorizing lists of words. However, when the participants took the memory test in the morning rather than the late afternoon, the age difference in performance decreased considerably (see Figure 18.4).

In a recent study, the memory performance of older adults also was poorer in the evening (Hogan & others, 2009). In this study, the older adults' performance on cognitive tasks was more variable than that of the younger adults, especially during their nonoptimal time of day—the evening.

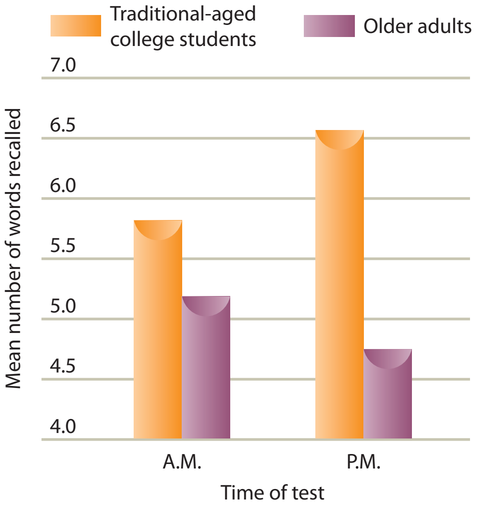


FIGURE **18.4**

MEMORY, AGE, AND TIME OF DAY TESTED (A.M. OR P.M.). In one study, traditional-aged college students performed better than older adults in both the a.m. and the p.m. Note, however, that the memory of the older adults was better when they were tested in the morning than in the afternoon, whereas the memory of the traditional-aged college students was not as good in the morning as it was in the afternoon (Hasher & others, 2001).

in memory will impair decision making (Brand & Markowitsch, 2010). However, older adults especially perform well when decision making is not constrained by time pressures and when the decision is meaningful for them (Yoon, Cole, & Lee, 2009).

Wisdom Does wisdom, like good wine, improve with age? What is this thing we call "wisdom"? **Wisdom** is expert knowledge about the practical aspects of life that permits excellent judgment about important matters. This practical knowledge involves exceptional insight into human development and life matters, good judgment, and an understanding of how to cope with difficult life problems. Thus, wisdom, more than standard conceptions of intelligence, focuses on life's pragmatic concerns and human conditions (Staudinger & Gluck, 2011). One recent study on wisdom revealed that older adults engaged in higher-ordered reasoning about social conflicts than young or middle-aged adults (Grossman & others, 2010). The higher-order reasoning activities that older adults used included multiple perspectives, allowance for compromise, and recognizing the limits of one's knowledge.

In regard to wisdom, research by Baltes and his colleagues (Baltes & Kunzmann, 2007; Baltes & Smith, 2008) has found that:

- High levels of wisdom are rare. Few people, including older adults, attain a high level of wisdom. That only a small percentage of adults show wisdom supports the contention that it requires experience, practice, or complex skills.
- The time frame of late adolescence and early adulthood is the main age window for wisdom to emerge (Staudinger & Dorner, 2007; Staudinger & Gluck,

wisdom Expert knowledge about the practical aspects of life that permits excellent judgment about important matters.

2011). No further advances in wisdom have been found for middle-aged and older adults beyond the level they attained as young adults.

- Factors other than age are critical for wisdom to develop to a high level. For example, certain life experiences, such as being trained and working in a field concerned with difficult life problems and having wisdom-enhancing mentors, contribute to higher levels of wisdom. Also, people higher in wisdom have values that are more likely to consider the welfare of others rather than their own happiness.
- Personality-related factors, such as openness to experience, generativity, and creativity, are better predictors of wisdom than cognitive factors such as intelligence.

Older adults might not be as quick with their thoughts or behavior as younger people, but wisdom may be an entirely different matter. This older man shares the wisdom of his experience with a classroom of children. *How is wisdom described by life-span developmentalists?*

Robert J. Sternberg (2000, 2009d, e), whose triarchic theory of intelligence we discussed in Chapter 9, argues that wisdom is linked to both practical and academic intelligence. In his view, academic intelligence is a necessary but in many cases insufficient requirement for wisdom. Practical knowledge about the realities of life also is needed for wisdom. For Sternberg, balance between self-interest, the interests of others, and contexts produces a common good. Thus, wise individuals don't just look out for themselves—they also need to consider others' needs and perspectives, as well as the particular context involved. Sternberg assesses wisdom by presenting problems to individuals that require solutions that highlight various intrapersonal, interpersonal, and contextual interests. Sternberg's emphasis on using knowledge for the common good in a manner that addresses competing interests is what mainly differentiates it from Baltes and his colleagues' view of wisdom.

EDUCATION, WORK, AND HEALTH

Education, work, and health are three important influences on the cognitive functioning of older adults. They are also three of the most important factors involved in understanding why cohort effects need to be taken into account in studying the cognitive functioning of older adults. Indeed cohort effects are very important to consider in the study of cognitive aging (Margrett & Deshpande-Kamat, 2009).

Education Successive generations in America's 20th century were better educated. Not only were today's older adults more likely to go to college when they were young adults than were their parents or grandparents, but more older adults than in past generations are returning to college today to further their education. Educational experiences are positively correlated with scores on intelligence tests and information-processing tasks, such as memory (Aiken Morgan, Sims, & Whitfield, 2010; Ganguli, & others, 2010; Schaie, 2008; Wilson & others, 2009).

Older adults might seek more education for a number of reasons (Manheimer, 2007). They might want to better understand the nature of their aging. They might want to learn more about the social and technological changes that have produced dramatic changes in their lives. They might want to discover relevant knowledge and to learn relevant skills to cope with societal and job demands in later life. They might recognize that they need further education to remain competitive and stay in the workforce. And older adults may seek more education to enhance their self-discovery and the leisure activities that will enable them to make a smoother adjustment to retirement.

> It is always in season
> for the old to learn.
>
> —Aeschylus
> *Greek Playwright, 5th Century B.C.*

Work Successive generations have also had work experiences that include a stronger emphasis on cognitively oriented labor (Elias & Wagster, 2007). Our great-grandfathers and grandfathers were more likely to be manual laborers than were our fathers, who are more likely to be involved in cognitively oriented occupations. As the industrial society continues to be replaced by the information society, younger generations will have more experience in jobs that require considerable cognitive investment. The increased emphasis on complex information processing in jobs likely enhances an individual's intellectual abilities (Kristjuhan & Taidre, 2010; Schooler & Kaplan, 2008).

In one study, substantive complex work was linked with higher intellectual functioning in older adults (Schooler, Mulatu, & Oates, 1999). This research is consistent with findings in a wide range of disciplines, including animal-based neurobiology studies, which strongly suggest that exposure to complex environments increases intellectual functioning throughout the life course (Kempermann, Kuhn, & Gage, 1997).

Health Successive generations have also been healthier in late adulthood as better treatments for a variety of illnesses (such as hypertension) have been developed. Many of these illnesses have a negative impact on intellectual performance (Dahle, Jacobs, & Raz, 2009; Pressler & others, 2010). Hypertension has been linked to lower cognitive performance in a number of studies, not only in older adults but also in young and middle-aged adults (Bucur & Madden, 2010). And, as we will see later in this chapter, Alzheimer disease has a devastating effect on older adults' physical and cognitive functioning (Alzheimer's Association, 2010; Schwam & Xu, 2010). Thus, some of the decline in intellectual performance found for older adults' is likely due to health-related factors rather than to age per se (Dahle, Jacobs, & Raz, 2009; Flicker, 2010).

K. Warner Schaie (1994) concluded that although some diseases—such as hypertension and diabetes—are linked to cognitive drop-offs, they do not directly cause mental decline. Rather, the lifestyles of the individuals with the diseases might be the culprits. For example, overeating, inactivity, and stress are related to both physical and mental decline (Christensen & others, 1996). And researchers have found age-related cognitive decline in adults with mood disorders, such as depression (Flicker, 2010; Gualtieri & Johnson, 2008).

How are education, work, and health linked to cognitive functioning in older adults?

A number of research studies have found that lifestyle and exercise are linked to improved cognitive functioning in older adults (Kramer & Morrow, 2009; Liu-Ambrose & others, 2010; Williamson & others, 2009). Here are the results of two of these studies:

- Community-dwelling women 65 years of age and older did not have cognitive impairment or physical limitations when they were initially assessed (Yaffe & others, 2001). Six to eight years later, the women with higher physical activity when they were initially assessed were less likely to experience cognitive decline.
- One hundred twenty-four individuals 60 to 75 years of age whose primary activity was sitting around the house were tested for their level of aerobic endurance and their level of cognitive functioning (Kramer & others, 1999). Cognitive functioning was assessed by tasks on working memory, planning, and scheduling. Half the group was randomly assigned to engage in yoga-type stretching activities and the other half was randomly assigned to start walking three times a week. After six months, the walkers averaged a mile in 16 minutes, a minute faster than at the beginning, and the stretchers had become more flexible. When their cognitive functioning was retested after six months, the walkers scored up to 25 percent higher on the cognitive tests than the stretchers did.

Other researchers have found that aerobic exercise is related to improved memory and reasoning (Erickson & others, 2009). Walking or any other aerobic exercise appears to get blood and oxygen pumping to the brain, which can help people think more clearly (Studenski & others, 2006).

Recent studies have documented that the mental health of older adults can also influence their cognitive functioning (Ebmeier, 2010). In one study, depressive symptoms predicted cognitive decline in older adults (Kohler & others, 2010). And a six-year longitudinal study found that higher levels of anxiety and depression assessed at the beginning of the study were linked to poorer memory functioning six years later (van Hooren & others, 2005).

A final aspect of health that is important to consider in cognitive functioning in older adults is *terminal decline*. This concept emphasizes that changes in cognitive functioning may be linked more to distance from death or cognition-related pathology than to distance from birth (Lovden & Lindenberger, 2007; Palgi & others, 2010). A recent study revealed that inconsistency in speed of processing was an early marker of impending death (Macdonald, Hultsch, & Dixon, 2008).

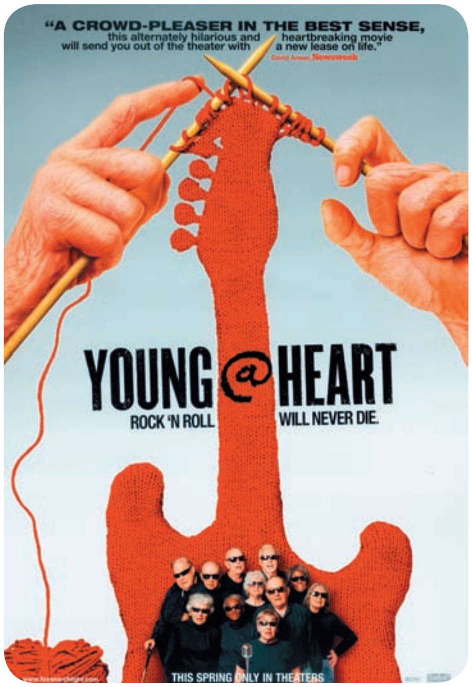
developmental **connection**

Health. Exercise is linked to increased longevity and the prevention of common chronic diseases. Chapter 17, p. 551

USE IT OR LOSE IT

Changes in cognitive activity patterns might result in disuse and consequent atrophy of cognitive skills (Hughes, 2010). This concept is captured in the concept of "use it or lose it." The mental activities that likely benefit the maintenance of cognitive skills in older adults are activities such as reading books, doing crossword puzzles, and going to lectures and concerts. Use it or lose it also is a significant component of the engagement model of cognitive optimization that emphasizes how intellectual and social engagement can buffer age-related declines in intellectual development (La Rue, 2010; Park & Reuter-Lorenz, 2009; Stine-Morrow & others, 2007). The following studies support the use or lose it concept and the engagement model of cognitive optimization:

- In an analysis of participants in the Victoria Longitudinal Study, when middle-aged and older adults participated in intellectually engaging activities it served to buffer them against cognitive decline (Hultsch & others, 1999). Recent analyses of the participants in this study revealed that engagement in cognitively complex activities was linked to faster and more consistent processing speed (Bielak & others, 2007).


"A CROWD-PLEASER IN THE BEST SENSE,
this alternately hilarious and heartbreaking movie will send you out of the theater with a new lease on life."
YOUNG@HEART
ROCK 'N ROLL
WILL NEVER DIE.
THIS SPRING ONLY IN THEATERS

The Young@Heart chorus—whose average age is 80. Young@Heart became a hit documentary in 2008. The documentary displays the singing talents, energy, and optimism of a remarkable group of older adults, who clearly are on the "use it" side of "use it or lose it."

- In a longitudinal study of 801 Catholic priests 65 years and older, those who regularly read books, did crossword puzzles, or otherwise exercised their minds were 47 percent less likely to develop Alzheimer disease than the priests who rarely engaged in these activities (Wilson & others, 2002).
- A recent study revealed that reading daily was linked to reduced mortality in men in their seventies (Jacobs & others, 2008).
- In another recent study, 488 individuals 75 to 85 years of age were assessed for an average of five years (Hall & others, 2009). At the beginning of the research, the older adults indicated how often they participated in six activities—reading, writing, doing crossword puzzles, playing card or board games, having group discussions, and playing music—on a daily basis. Across the five years of the study, the point at which memory loss accelerated was assessed and it was found that for each additional activity the older adult engaged in, the onset of rapid memory loss was delayed by .18 years. For older adults who participated in 11 activities per week compared to their counterparts who engaged in only 4 activities per week, the point at which accelerated memory decline occurred was delayed by 1.29 years.

TRAINING COGNITIVE SKILLS

If older adults are losing cognitive skills, can they be retrained? An increasing number of research studies indicate that they can to a degree (Boron, Willis, & Schaie, 2007; Kramer & Morrow, 2010; Park & Reuter-Lorenz, 2009; Willis, Schaie, & Martin, 2009). Two key conclusions can be derived from research in this area: (1) Training can improve the cognitive skills of many older adults, but (2) there is some loss in plasticity in late adulthood, especially in the oldest-old, 85 years and older (Baltes, Lindenberger, & Staudinger, 2006). A recent research review concluded that providing structured experience in situations requiring higher-level cognitive coordination of skills—such as playing complex video games, switching tasks, and dividing attention—can improve older adults' cognitive skills (Hertzog & others, 2009). Let's now examine several cognitive training studies with older adults.

In an extensive recent study by Sherry Willis and her colleagues (2006), older adults were randomly assigned to one of four groups: training in (1) reasoning, (2) memory, (3) speed of processing, or (4) a control group that received no training. Each type of training showed an immediate effect in its domain—reasoning training improved reasoning, memory training improved memory, and speed of processing training improved speed of processing. However, the training effects did not transfer across cognitive domains, such that speed of processing training did not benefit the older adults' memory or reasoning, for example. The older adults who were given reasoning training did have less difficulty in the activities of daily living than a control group who did not receive this training. The activities of daily living that were assessed included how independently the older adults were able to prepare meals, do housework, do finances, go shopping, and engage in health maintenance. Each intervention maintained its effects on the specific targeted ability across the five years of the study. However, neither memory nor speed of processing training benefited the older adults' activities of daily living.

To what extent can training improve cognitive functioning of older adults?

Another recent study had older adults participate in a 20-week activity called Senior Odyssey, a team-based program involving creative problem solving that is derived from the Odyssey of the Mind program for children and emerging adults (Stine-Morrow & others, 2007). In a field experiment, compared to a control group who did not experience Senior Odyssey, the Senior Odyssey participants showed improved processing speed, somewhat improved creative thinking, and increased mindfulness. *Mindfulness* involves generating new ideas, being open to new information, and being aware of multiple perspectives (Langer, 2000, 2007).

Another study trained older adults to increase their processing speed (Ball, Edwards, & Ross, 2007). As a result of the training, older adults increased their processing speed and the gain was maintained for two years. The benefits of the processing speed training translated into improvements in everyday activities, such as safer driving performance. Yet another study found that older adults with cognitive speed of processing difficulties who completed speed of processing training were 40 percent less likely to quit driving over the subsequent three years (Edwards, Delahunt, & Mahncke, 2009).

As we discussed earlier in the chapter, researchers are also finding that improving the physical fitness of older adults can improve their cognitive functioning (Baker & others, 2010; Erickson & others, 2009). A research review revealed that aerobic fitness training improved the planning, scheduling, working memory, resistance to distraction, and processing involving multiple tasks in older adults (Colcombe & Kramer, 2003).

In sum, the cognitive vitality of older adults can be improved through cognitive and physical fitness training (Kramer & Morrow, 2009; Park & Reuter-Lorenz, 2009). However, benefits have not been observed in all studies (Salthouse, 2006). Further research is needed to determine more precisely which cognitive improvements occur through cognitive and physical fitness training in older adults.

COGNITIVE NEUROSCIENCE AND AGING

On several occasions in this chapter and in Chapter 17, we have discussed that certain regions of the brain are involved in links between aging and cognitive functioning. In this section, we further explore the substantial increase in interest in the brain's role in aging and cognitive functioning. The field of *cognitive neuroscience* has emerged as the major discipline that studies links between brain and cognitive functioning (Meeks & Jeste, 2009; Phillips & Andres, 2010; Schiavone & others, 2009; Voelcker-Rehage, Godde, & Staudinger, 2010). This field especially relies on brain imaging techniques, such as fMRI, PET, and DTI (diffusion tensor imaging) to reveal the areas of the brain that are activated when individuals are engaging in certain cognitive activities (Charlton & others, 2010; Erickson & others, 2009; Kennedy & Raz, 2009; Park & Reuter-Lorenz, 2009; Ystad & others, 2010). For example, as an older adult is asked to encode and then retrieve verbal materials or images of scenes, the older adult's brain activity will be monitored by an fMRI brain scan.

developmental **connection**

Brain Development. The activities older adults engage in can influence the brain's development. Chapter 17, p. 540

Changes in the brain can influence cognitive functioning and changes in cognitive functioning can influence the brain. For example, aging of the brain's prefrontal cortex may produce a decline in working memory (Smith, 2007). And when older adults do not regularly use their working memory (recall the section on "Use It or Lose It"), neural connections in the prefrontal lobe may atrophy. Further, cognitive interventions that activate older adults' working memory may increase these neural connections.

Although in its infancy as a field, the cognitive neuroscience of aging is beginning to uncover some important links between aging, the brain, and cognitive functioning. These include:

- Neural circuits in specific regions of the brain's prefrontal cortex decline and this decline is linked to poorer performance by older adults on complex reasoning tasks, working memory, and episodic memory tasks (Grady & others, 2006).
- Recall from Chapter 17 that older adults are more likely than younger adults to use both hemispheres of the brain to compensate for aging declines in attention, memory, and language (Dennis & Cabeza, 2008).
- Functioning of the hippocampus declines but less so than the functioning of the frontal lobes in older adults.

- Patterns of neural decline with aging are larger for retrieval than encoding (Gutchess & others, 2005).
- Compared with younger adults, older adults show greater activity in the frontal and parietal regions while they are engaging in tasks that require cognitive control processes such as attention (Park & Gutchess, 2005).
- Younger adults have better connectivity between brain regions than older adults. For example, a recent study revealed that younger adults had more connections between brain activations in frontal, occipital, and hippocampal regions than older adults during a difficult encoding task (Leshikar & others, 2010).
- An increasing number of cognitive and fitness training studies include brain imaging techniques such as fMRI to assess the results of such training on brain functioning (Erickson & others, 2009). In one study, older adults who walked one hour a day three days a week for six months showed increased volume in the frontal and temporal lobes of the brain (Colcombe & others, 2006).

Denise Park and Patricia Reuter-Lorenz (2009) recently proposed a neurocognitive scaffolding view of connections between the aging brain and cognition. In this view, increased activation in the prefrontal cortex with aging reflects an adaptive brain that is compensating to the challenges of declining neural structures and function, and declines in various aspects of cognition, including working memory and long-term memory. Scaffolding involves the use of complementary, neural circuits to protect cognitive functioning in an aging brain. Among the factors that can strengthen brain scaffolding are cognitive engagement and exercise.

In the next several decades, we are likely to see increased effort to uncover links among aging, the brain, and cognitive functioning.

Review *Connect* Reflect

LG1 Describe the cognitive functioning of older adults.

Review

- How is cognition multidimensional and multidirectional in older adults? What changes in cognitive processes take place in aging adults?
- How do education, work, and health affect cognition in aging adults?
- What is the concept of "use it or lose it"?
- To what extent can older adults' cognitive skills be trained?
- What characterizes the cognitive neuroscience of aging?

Connect

- The term *scaffolding* was used in this section to describe the use of complementary, neural circuits to protect cognitive functioning in an aging brain. How has the term *scaffolding* been used elsewhere in the text?

Reflect *Your Own Personal Journey of Life*

- Can you think of older adults who have made significant contributions in late adulthood other than those we mentioned in the chapter? Spend some time reading about these individuals and evaluate how their intellectual interests contributed to their life satisfaction as older adults. What did you learn from their lives that might benefit your cognitive development and life satisfaction as an older adult?

2 Language Development

LG2 Characterize changes in language in older adults.

Most research on language development has focused on infancy and childhood. It is generally thought that for most of adulthood individuals maintain their language skills (Thornton & Light, 2006). The vocabulary of individuals often continues to increase throughout most of the adult years, at least until late adulthood (Willis & Schaie, 2005; Schaie, 2010, 2011). Many older adults maintain or improve their word knowledge and word meaning (Burke & Shafto, 2004).

In late adulthood, however, some decrements in language may appear (Obler, 2009). Among the most common language-related complaints reported by older adults are difficulty in retrieving words to use in conversation and understanding spoken language in certain contexts (Clark-Cotton & Goral, 2007). This often involves the *tip-of-the-tongue phenomenon*, in which individuals are confident that they can remember something but just can't quite seem to retrieve it from memory, which we discussed earlier in the section on memory and aging (Thornton & Light, 2006). Older adults also report that in less than ideal listening conditions they can have difficulty in understanding speech. This difficulty is most likely to occur when speech is rapid, competing stimuli are present (a noisy room, for example), and when they can't see their conversation partner (in a telephone conversation, for example). The difficulty in understanding speech may be due to hearing loss (Gordon-Salant & others, 2006). In general, though, most language skills decline little among older adults if they are healthy (Clark-Cotton & others, 2007).

Some aspects of the phonological skills of older adults are different than those of younger adults (Clark-Cotton & others, 2007). Older adults' speech is typically lower in volume, slower, less precisely articulated, and less fluent (more pauses, fillers, repetition, and corrections). Despite these age differences, most older adults' speech skills are adequate for everyday communication.

Researchers have found conflicting information about changes in *discourse* (extended verbal expression in speech or writing) with aging. "Some (researchers) have reported increased elaborateness, while others have reported less varied and less complex syntax" (Obler, 2009, p. 459). One aspect of discourse where age differences have been found involves retelling a story or giving instructions for completing a task. When engaging in this type of discourse, older adults are more likely than younger adults to omit key elements, creating discourse that is less fluent and more difficult to follow (Clark-Cotton & others, 2007).

Nonlanguage factors may be responsible for some of the decline in language skills that do occur in older adults (Obler, 2009). Slower information-processing speed and a decline in working memory, especially in being able to keep information in mind while processing, likely contribute to lowered language efficiency in older adults (Stine-Morrow, 2007).

Language does change among individuals with Alzheimer disease, which we will discuss later in the chapter (Obler, 2009). Word-finding/generating difficulties are one of the earliest symptoms of Alzheimer disease, but most individuals with the disease retain much of their ability to produce well-formed sentences until the late stages of the disease. Nonetheless, they do make more grammatical errors than older adults without the disease.

What are some differences in the way older and younger adults communicate?

Review *Connect* Reflect

LG2 Characterize changes in language in older adults.

Review

- What are the main changes in language development in older adults?

Connect

- In this section, we learned that some aspects of the phonological skills of older adults are different than those of younger adults. By what age are children typically capable of producing all the vowel sounds and most of the consonant sounds of their language (discussed in Chapter 7)?

Reflect *Your Own Personal Journey of Life*

- What might you be able to do as an older adult to preserve or even enhance your language skills?

3 Work and Retirement

LG3 Discuss aging and adaptation to work and retirement.

Work

Retirement in the United States and in Other Countries

Adjustment to Retirement

What percentage of older adults continues to work? How productive are they? Who adjusts best to retirement? What is the changing pattern of retirement in the United States and around the world? These are some of the questions we now examine.

WORK

In the beginning of the 21st century, the percentage of men over the age of 65 who continue to work full-time is less than at the beginning of the 20th century, even though changes in federal law now allow individuals over the age of 65 to continue working (Shore & Goldberg, 2005). The decline from 1900 to 2000 has been as much as 70 percent.

developmental **connection**

Work. In the United States, approximately 80 percent of individuals 40 to 59 years of age are employed. Chapter 15, p. 492

Significant numbers of retirees only partially retire, moving to part-time employment by either reducing the number of hours they work on their career jobs or by taking on new (and frequently lower-paying) jobs (Hardy, 2006). Self-employed men are especially likely to continue paid employment, either on the same job or on a new job.

Ruby Johnson, 93, wraps heat-resistant tape around coils to insulate an electrical terminal at the company where she works in Menomonee Falls, Wisconsin. *What are some variations in work and retirement in older adults?*

Some individuals maintain their productivity throughout their lives (Cleveland & Shore, 2007). Some of these older workers work as many or more hours than younger workers. In the National Longitudinal Survey of Older Men, good health, a strong psychological commitment to work, and a distaste for retirement were the most important characteristics related to continued employment into old age (seventies and eighties) (Parnes & Sommers, 1994). The probability of employment also was positively correlated with educational attainment and being married to a working wife.

Especially important to think about is the large cohort of baby boomers—78 million people—who will begin to reach traditional retirement age in 2010. Because this cohort is so large, and these are difficult economic times, we are likely to see increasing numbers of older adults continue to work (Hart, 2007). The aging of the U.S. workforce will continue at least until 2034 when the largest number of the baby-boom cohorts reaches 70 (Manton & others, 2007).

Cognitive ability is one of the best predictors of job performance in older adults. And older workers have lower rates of absenteeism, fewer accidents, and increased job satisfaction, compared with their younger counterparts (Warr, 2004). Thus, the older worker can be of considerable value to a company, above and beyond the older worker's cognitive competence. Also, remember from our discussion earlier in the chapter that substantively complex work is linked with a higher level of intellectual functioning (Schooler, 2007). This likely is a reciprocal relation—that is, individuals with higher cognitive ability likely continue to work as older adults, and when they work in substantively complex jobs, their intellectual functioning is no doubt enhanced.

An increasing number of middle-aged and older adults are embarking on a second or a third career (Moen & Spencer, 2006). Many older adults also participate in unpaid work—as a volunteer or as an active participant in a voluntary association. These options afford older adults opportunities for productive activity, social interaction, and a positive identity.

In summary, age affects many aspects of work (Bohle, Pitts, & Quinlin, 2010; Falba, Sindelar, & Gallo, 2009; Charness, Czaja, & Sharit, 2007). Nonetheless, many studies of work and aging—such as evaluation of hiring and performance—reveal inconsistent results. Important contextual factors, such as

> The night hath not yet come:
> We are not quite cut off from labor by
> the failing of light; some work remains
> for us to do and dare.
>
> —Henry Wadsworth Longfellow
> *American Poet, 19th Century*

age composition of departments or applicant pools, occupations, and the jobs themselves, all affect decisions about older workers. It also is important to recognize that ageist stereotypes of workers and of tasks can limit older workers' career opportunities and can encourage early retirement or other forms of downsizing that adversely affect older workers (Finkelstein & Farrell, 2007). For example, one study found that extensive negative stereotyping of older adults was involved in not hiring them (Gringart, Helmes, & Speelman, 2005). Also, employers' attributes of negative ageist stereotyping often focus on trainability, adaptability, creativity, and interest in new technology (Scialfa & Fernie, 2006).

RETIREMENT IN THE UNITED STATES AND IN OTHER COUNTRIES

At what age do most people retire in the United States? Do many people return to the workforce at some point after they have retired? What is retirement like in other countries?

Retirement in the United States The option to retire is a late-20th-century phenomenon in the United States (Higo & Williamson, 2009). It exists largely because of the 1935 implementation of the Social Security system, which gives benefits to older workers when they retire. On the average, today's workers will spend 10 to 15 percent of their lives in retirement. A recent survey revealed that as baby boomers move into their sixties, they expect to retire later than either their parents or their grandparents (Frey, 2007).

In the past, when most people reached an accepted retirement age, such as some point in their sixties, retirement meant a one-way exit from full-time work to full-time leisure (Atchley, 2007). Leading expert Phyllis Moen (2007) recently described how today, when people reach their sixties, the life path they follow is less clear: (1) some individuals don't retire, continuing in their career jobs; (2) some retire from their career work and then take up a new and different job; (3) some retire from career jobs but do volunteer work; (4) some retire from a post-retirement job and go on to yet another job; (5) some move in and out of the workforce, so they never really have a "career" job from which they retire; (6) some individuals who are in poor health move to a disability status and eventually into retirement; and (7) some who are laid off define it as "retirement."

Approximately 7 million retired Americans return to work after they have retired (Putnam Investments, 2006). When retired adults return to the labor force, it occurs on average four years after retirement (Hardy, 2006). In many instances, the jobs pay much less than their pre-retirement jobs. In one study of older adults who returned to work, approximately two-thirds said they were happy they had done so while about one-third indicated they were forced to go back to work to meet financial needs (Putnam Investments, 2006).

Just as the life path after individuals reach retirement age may be varied, so are the reasons for working. For example, some older adults who reach retirement age work for financial reasons, others to stay busy, and yet others to "give back" (Moen, 2007).

Work and Retirement in Other Countries What characterizes work and retirement in other countries? A recent large-scale study of 21,000 individuals aged 40 to 79 in 21 countries examined patterns of work and retirement (HSBC Insurance, 2007). On average, 33 percent of individuals in their sixties and 11 percent in their seventies were still in some kind of paid employment. In this study, 19 percent of those in their seventies in the United States were still working. As indicated in Figure 18.5, a substantial percentage of individuals expect to continue working as long as possible before retiring (HSBC Insurance, 2007).

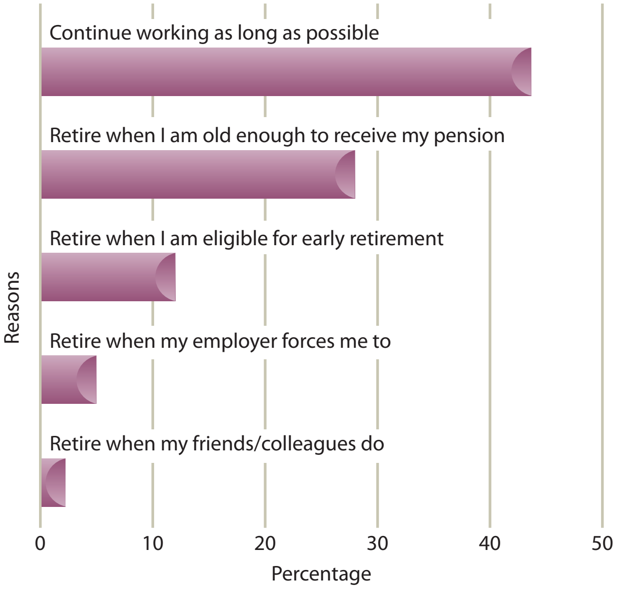


FIGURE **18.5**

REASONS GIVEN BY PEOPLE REGARDING WHEN THEY EXPECT TO RETIRE FROM WORK

In the recent cross-national study, to what extent did Japanese retirees miss the work and the money in comparison to U.S. retirees?

In a recent study of work and retirement in 21 countries, Japanese retirees missed the work slightly more than they expected and the money considerably less than they expected (HSBC Insurance, 2007). U.S. retirees missed both the work and the money slightly less than they expected. German retirees were the least likely to miss the work, Turkish and Chinese retirees the most likely to miss it. Regarding the money, Japanese and Chinese retirees were the least likely to miss it, Turkish retirees the most likely to miss it.

Early retirement policies were introduced by many companies in the 1970s and 1980s with an intent to make room for younger workers. However, in the recent survey there was some indication that an increasing number of adults are beginning to reject the early retirement option as they hear about people who retired and then regretted it. In a 21-country study, on average only 12 percent of individuals in their forties and fifites expected to take early retirement while 16 percent in their sixties and seventies had taken early retirement. Only in Germany, South Korea, and Hong Kong did a higher percentage of individuals expect earlier retirement than in the past.

ADJUSTMENT TO RETIREMENT

Retirement is a process, not an event (Moen, 2007). Much of the research on retirement has been cross-sectional rather than longitudinal and has focused on men rather than women. One recent study found that men had higher morale when they had retired within the last two years compared with men who had been retired for longer periods of time (Kim & Moen, 2002). Another recent study revealed that retired married and remarried women reported being more satisfied with their lives and in better health than retired women who were widowed, separated, divorced, or had never been married (Price & Joo, 2005). And a recent study indicated that women spend less time planning for retirement than men do (Jacobs-Lawson, Hershey, & Neukam, 2005).

Older adults who adjust best to retirement are healthy, have adequate income, are active, are better educated, have an extended social network including both friends and family, and usually were satisfied with their lives before they retired (Jokela & others, 2010; Raymo & Sweeney, 2006). Older adults with inadequate income and poor health, and who must adjust to other stress that occurs at the same time as retirement, such as the death of a spouse, have the most difficult time adjusting to retirement (Reichstadt & others, 2007). A recent study also found that individuals who had difficulty in adjusting to retirement had a strong attachment to work, including full-time jobs and a long work history, lack of control over the transition to retirement, and low self-efficacy (van Solinge & Henkens, 2005).

The U.S. retirement system is in transition (Ghilarducci, 2010; Helman, Copeland, & VanDerhei, 2010; VanDerhei, 2010). Following are the results of a 2007 survey on retirement (Helman, VanDerhei, & Copeland, 2007): Half of the workers were not confident about their pension benefits; many workers count on benefits that won't be there when they retire; workers often don't heed advice about retirement even when they are provided the advice; workers overestimate long-term care coverage; most workers' savings are modest; and many workers know little about the social security income they will receive when they retire.

Flexibility is also a key factor in whether individuals adjust well to retirement. When people retire, they no longer have the structured environment they had when they were working, so they need to be flexible and discover and pursue their own interests. Cultivating interests and friends unrelated to work improves adaptation to retirement.

In addition to financial planning, what are some other aspects of retirement planning that need to be carried out?

Planning and then successfully carrying out the plan are important aspects of adjusting well in retirement. A special concern in retirement planning involves women, who are likely to live longer than men and more likely to live alone (less likely to remarry and more likely to be widowed) (Moen, 2007; Silver, 2010).

Individuals who view retirement planning only in terms of finances don't adapt as well to retirement as those who have a more balanced retirement plan (Birren, 1996). It is important not only to plan financially for retirement, but to consider other areas of your life as well (Sener, Terzioglu, & Karabulet, 2007). In addition to financial planning, questions individuals need to ask about retirement include, What am I going to do with my leisure time? What am I going to do to stay active? What am I going to do socially? What am I going to do to keep my mind active?

Review *Connect* Reflect

LG3 Discuss aging and adaptations to work and retirement.

Review

- What characterizes the work of older adults?
- Compare retirement in the United States with other countries.
- How can individuals adjust effectively to retirement?

Connect

- In Chapter 12, we learned that U.S. adolescents spend too much time in unstructured leisure activities compared to East Asian adolescents. How might establishing challenging life-long leisure activities as an adolescent benefit an individual at retirement age?

Reflect *Your Own Personal Journey of Life*

- At what age would you like to retire? Or would you prefer to continue working as an older adult as long as you are healthy?

4 Mental Health

LG4 Describe mental health problems in older adults.

Depression

Dementia, Alzheimer Disease, and Other Afflictions

Fear of Victimization, Crime, and Elder Maltreatment

Although a substantial portion of the population can now look forward to a longer life, that life may unfortunately be hampered by a mental disorder in old age. This prospect is both troubling to the individual and costly to society. Mental disorders make individuals increasingly dependent on the help and care of others. The cost of mental health disorders in older adults is estimated at more than $40 billion per year in the United States. More important than the loss in dollars, though, is the loss of human potential and the suffering. Although mental disorders in older adults are a major concern, older adults do not have a higher incidence of mental disorders than younger adults do (Busse & Blazer, 1996).

DEPRESSION

Major depression is a mood disorder in which the individual is deeply unhappy, demoralized, self-derogatory, and bored. The person does not feel well, loses stamina easily, has a poor appetite, and is listless and unmotivated. Major depression has been called the "common cold" of mental disorders. However, a recent review concluded that depression is less common among older adults than younger adults (Fiske, Wetherell, & Gatz, 2009). More than half of the cases of depression in older adults represents the first time these individuals have developed depression in their life (Fiske, Wetherell, & Gatz, 2009).

One study found that the lower frequency of depressive symptoms in older adults compared with middle-aged adults was linked to fewer economic hardships,

major depression A mood disorder in which the individual is deeply unhappy, demoralized, self-derogatory, and bored. The person does not feel well, loses stamina easily, has poor appetite, and is listless and unmotivated. Major depression is so widespread that it has been called the "common cold" of mental disorders.

fewer negative social interchanges, and increased religiosity (Schieman, van Gundy, & Taylor, 2004). Other research indicates that older adults who engage in regular exercise, especially aerobic exercise, are less likely to be depressed, whereas those who are in poor health and experiencing pain are more likely to be depressed (Mavandadi & others, 2007). Depressive symptoms increase in the oldest-old (85 years and older), and this increase is associated with a higher percentage of women in the group, more physical disability, more cognitive impairment, and lower socioeconomic status (Hybels & Blazer, 2004).

In the child, adolescent, and early adulthood years, females show greater depression than males do (Nolen-Hoeksema, 2011). Does this gender difference hold for middle-aged and older adults? A longitudinal study found greater depression in women than men at 50 and 60 years of age, but not at 80 years of age (Barefoot & others, 2001). Men showed increases in depressive symptoms from 60 to 80, but women did not. In this cohort, men may have undergone more profound role shifts after 60 years of age because they were more likely than women to have retired from active involvement in the work world. Thus, the absence of a gender difference in depression in older adults may be cohort-specific and may not hold as women who have entered the workforce in greater numbers are assessed in late adulthood.

developmental **connection**

Gender. One reason that females have higher rates of depression is that they ruminate more in their depressed mood and amplify it more than males do. Chapter 12, p. 404

Among the most common predictors of depression in older adults are earlier depressive symptoms, poor health, disability, loss events such as the death of a spouse, and low social support (Lee & Park, 2008; Ng & others, 2010). Insomnia is often overlooked as a risk factor for depression in older adults (Fiske, Wetherell, & Gatz, 2009). Curtailment of daily activities is a common pathway to late-life depression (Fiske, Wetherell, & Gatz, 2009). Often accompanying this curtailment of activity is an increase in self-critical thinking that exacerbates depression.

What characterizes depression in older adults?

Depression is a treatable condition, not only in young adults but in older adults as well (Asghar-Ali & Braun, 2009; Vahia & others, 2010). Unfortunately, as many as 80 percent of older adults with depressive symptoms receive no treatment at all. Combinations of medications and psychotherapy produce significant improvement in almost four out of five older adults with depression (Koenig & Blazer, 1996). Also, engagement in valued activities and religious/spiritual involvement can reduce depressive symptoms (Fiske, Wetherell, & Gatz, 2009). Life review/reminiscence therapy, which we will further discuss in Chapter 19, is underutilized in the treatment of depression in older adults (Fiske, Wetherell, & Gatz, 2009).

Major depression can result not only in sadness, but also in suicidal tendencies (Bergman, Levy, & others, 2010). Nearly 25 percent of individuals who commit suicide in the United States are 65 years of age or older (Church, Siegel, & Fowler, 1988). The older adult most likely to commit suicide is a male who lives alone, has lost his spouse, and is experiencing failing health (Ruckenhauser, Yazdani, & Ravaglia, 2007).

DEMENTIA, ALZHEIMER DISEASE, AND OTHER AFFLICTIONS

Among the most debilitating of mental disorders in older adults are the dementias (Jellinger, 2009). In recent years, extensive attention has been focused on the most common dementia, Alzheimer disease. Other afflictions common in older adults are multi-infarct dementia and Parkinson disease.

Dementia **Dementia** is a global term for any neurological disorder in which the primary symptoms involve a deterioration of mental functioning. Individuals with dementia often lose the ability to care for themselves and can lose the ability to recognize familiar surroundings and people—including family members (Mast & Healy, 2009; Okura & others, 2010; Travers, Martin-Kahn, & Lie, 2010). It is estimated that 23 percent of women and 17 percent of men 85 years and older are at risk for developing dementia (Alzheimer's Association, 2010). However, these

dementia A global term for any neurological disorder in which the primary symptoms involve a deterioration of mental functioning.

estimates may be high because of the Alzheimer's Association's lobbying efforts to increase funding for research and treatment facilities. Dementia is a broad category and it is important that every effort is made to narrow the older adult's disorder and determine a specific cause of the deteriorating mental functioning.

Alzheimer Disease One form of dementia is **Alzheimer disease**—a progressive, irreversible brain disorder that is characterized by a gradual deterioration of memory, reasoning, language, and eventually, physical function. In 2010, an estimated 5.3 million adults in the United States had Alzheimer disease, and it is projected that 10 million Baby Boomers (individuals born from 1946 to 1964) will develop the disease in their lifetime (Alzheimer's Association, 2010). Figure 18.6 shows the estimated risks for developing Alzheimer disease at different ages for women and men (Alzheimer's Association, 2010). Women are likely to develop the disease because they live longer than men and their longer life expectancy increases the number of years during which they can develop the disease. It is estimated that Alzheimer disease triples the health care costs of Americans 65 years of age and older (Alzheimer's Association, 2010). Because of the increasing prevalence of the disease, researchers have stepped up their efforts to discover the causes of the disease and to find more effective ways to treat it (Chiba & others, 2009; O'Bryant & others, 2009; Reiman, Langbaum, & Tariot, 2010).

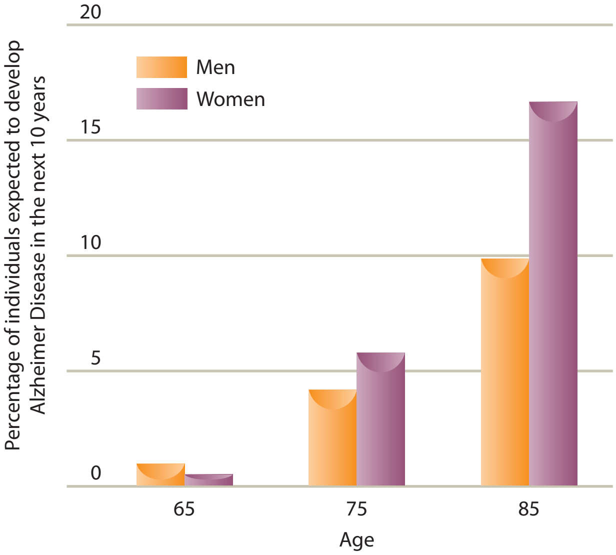


FIGURE **18.6**

ESTIMATED RISKS FOR DEVELOPING ALZHEIMER DISEASE AT DIFFERENT AGES FOR WOMEN AND MEN

Source: Alzheimer's Association (2010). 2010 Alzheimer's facts and figures. *Alzheimer's & Dementia, 6*, 158–194.

Because of differences in onset, Alzheimer also is now described as *early-onset* (initially occurring in individuals younger than 65 years of age) or *late-onset* (which has its initial onset in individuals 65 years of age and older). Early-onset Alzheimer disease is rare (about 10 percent of all cases) and generally affects people 30 to 60 years of age.

Once destruction of brain tissue occurs in Alzheimer disease, it is unlikely that effective treatment of the disease will reverse the damage, at least based on the current state of research and the foreseeable future. Thus, an important agenda for Alzheimer disease research is to focus on the disease's biological and environmental risk factors, the development of preventive strategies to reduce the likelihood that brain tissue damage will occur, and the maintenance of cognitive reserves in middle adulthood.

Alzheimer disease involves a deficiency in the important brain messenger chemical acetylcholine, which plays an important role in memory (Alcaro & others, 2010; Mura & others, 2010; Rentz & others, 2010). Also, as the disease progresses, the brain shrinks and deteriorates (see Figure 18.7). The deterioration of the brain in Alzheimer disease is characterized by the formation of *amyloid plaques* (dense deposits of protein that accumulate in the blood vessels) and *neurofibrillary tangles* (twisted fibers that build up in neurons) (Galimberti & Scarpini, 2010; Tabira, 2009; Tarawneh & Holtzman, 2010). Researchers are especially seeking ways to interrupt the progress of amyloid plaques and neurofibrillary tangles in patients with Alzheimer disease (Miura & others, 2007).

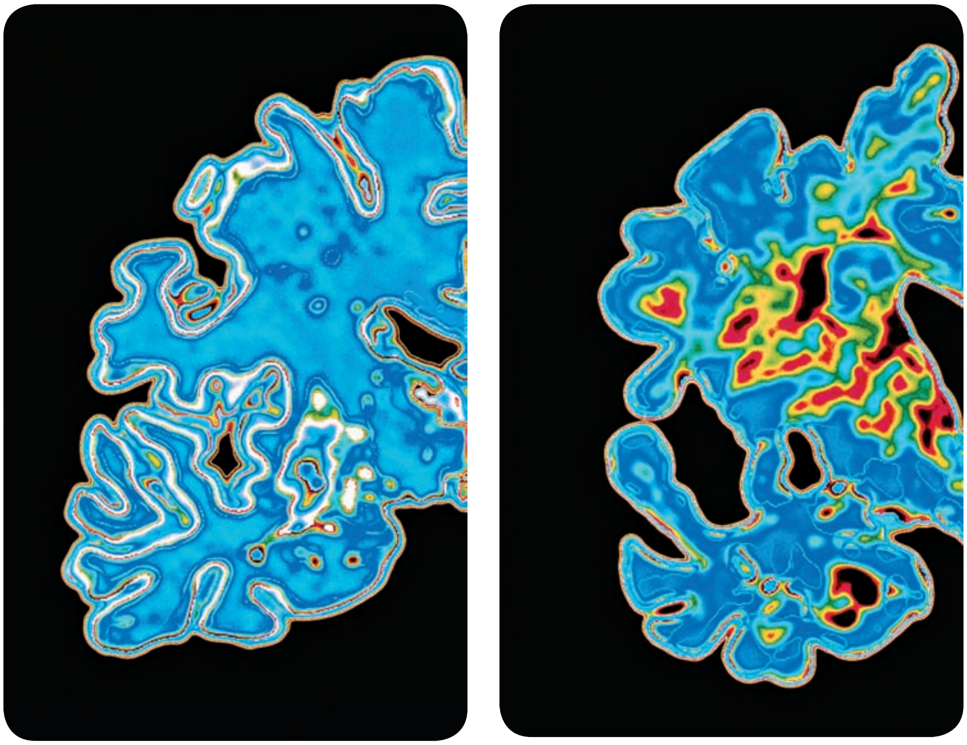
There is increasing interest in the role that oxidative stress might play in Alzheimer disease (Bonda & others, 2010; Di Bona & others, 2010; Galasko & others, 2010). Oxidative stress occurs when the body's antioxidant defenses don't cope with the free-radical attacks and oxidation in the body. Recall from Chapter 17 that free-radical theory is a major theory of biological aging.

Although scientists are not certain what causes Alzheimer disease, age is an important risk factor and genes also likely play an important role (Avramopoulos, 2009; Bettens, Sleegers, & Van Broeckhoven, 2010; Gomez Ravetti & others, 2010). The number of individuals with Alzheimer disease doubles every five years after the age of 65. A gene called *apolipoprotein E* (*apoE*), which is linked to increasing presence of plaques and tangles in the brain, could play a role in as many as one-third of

Alzheimer disease A progressive, irreversible brain disorder characterized by a gradual deterioration of memory, reasoning, language, and eventually physical function.

FIGURE **18.7**

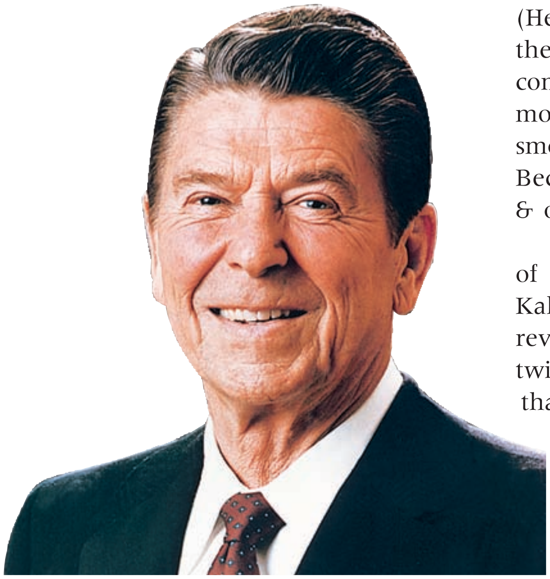
TWO BRAINS: NORMAL AGING AND ALZHEIMER DISEASE. The left computer graphic shows a slice of a normal aging brain, the right photograph a slice of a brain ravaged by Alzheimer disease. Notice the deterioration and shrinking in the Alzheimer disease brain.



the cases of Alzheimer disease (Golanska & others, 2009; Lane & He, 2009; Vemuri & others, 2010). In one study of almost 12,000 pairs of twins in Sweden, identical twins were both more likely to develop the disease than fraternal twins, suggesting a genetic influence on the disease (Gatz & others, 2006).

Although individuals with a family history of Alzheimer disease are at greater risk, the disease is complex and likely caused by a number of factors, including lifestyles. For many years, scientists have known that a healthy diet, exercise, and weight control can lower the risk of cardiovascular disease. Now, they are finding that these healthy lifestyle factors may also lower the risk of Alzheimer disease. Researchers have revealed that older adults with Alzheimer disease are more likely also to have cardiovascular disease than are individuals who do not have the disease (Helzner & others, 2009; Reynolds & others, 2010). Autopsies show that brains with the telltale signs of tangles and plaques of Alzheimer patients are three times more common in individuals with cardiovascular disease (Sparks & others, 1990). Recently, more cardiac risk factors have also been implicated in Alzheimer disease—obesity, smoking, atherosclerosis, high cholesterol, and lipids (Abellan & others, 2009; Florent-Bechard & others, 2009; Reynolds & others, 2010; Sonnen & others, 2009; Sottero & others, 2009).

As with many problems associated with aging, exercise may also reduce the risk of Alzheimer disease (Geda & others, 2010; Radak & others, 2010; Rolland, van Kahn, & Vellas, 2010). One study of more than 2,000 men 71 to 93 years of age revealed that those who walked less than one-fourth of a mile a day were almost twice as likely to develop the disease as their male counterparts who walked more than two miles a day (Abbott & others, 2004). And another study of older adults found that those who exercised three or more times a week were less likely to develop Alzheimer disease over a six-year period than those who exercised less (Larson & others, 2006).



Former president Ronald Reagan was diagnosed with Alzheimer disease at age 83.

Early Detection and Alzheimer Disease *Mild cognitive impairment* (*MCI*) represents a transitional state between the cognitive changes of normal aging and very early Alzheimer disease and other dementias. MCI is increasingly recognized as a risk factor for Alzheimer disease. Estimates indicate that as many as 10 to 20 percent of individuals 65 years of age and older have MCI (Alzheimer's Association, 2010). Some individuals with MCI do not go on to develop Alzheimer disease, but MCI is a risk factor for the disease.

Distinguishing between individuals who merely have age-associated declines in memory and those with MCI is difficult, as is predicting which individuals with MCI will subsequently develop Alzheimer disease (Schwam & Xu, 2010; Vellas & Aisen, 2010). One effort in this regard is to have individuals with MCI undergo an fMRI (functional magnetic resonance imaging) brain scan (Pihlajamaki, Jauhiainen, & Soininen, 2009). If the scan shows that certain brain regions involved in memory are smaller than those of individuals without memory impairments, the individual is more likely to progress to Alzheimer disease (Alzheimer's Association, 2010). Also, recent research indicates that individuals without MCI have a higher degree of cortical thickness than individuals with MCI (Wang & others, 2009). In addition, fMRI scans can detect changes in the brain that are fairly typical of early-Alzheimer disease, even before symptoms develop (Matsuda, 2007). A recent research review indicated that fMRI measurement of neuron loss in the medial temporal lobe is a predictor of memory loss and eventually dementia (Vellas & Aisen, 2010).

Longitudinal studies have indicated that certain aspects of memory may provide indicators of subsequent dementia and Alzheimer disease (Jessen & others, 2010; Johnson & others, 2009). In one study, performance on a short verbal recall memory task in individuals with no indication of the presence of Alzheimer disease was linked to whether the disease was present in the individuals 10 years later (Tierney & others, 2005). In another study, older adults whose episodic memory was impaired in an initial assessment were more than twice as likely to develop Alzheimer disease over a 10-year period than those with impairments in other cognitive domains such as semantic memory, working memory, and visual-spatial ability (Aggarwal & others, 2005).

Drug Treatment of Alzheimer Disease Several drugs called cholinerase inhibitors have been approved by the U.S. Food and Drug Administration to treat Alzheimer disease. They are designed to improve memory and other cognitive functions by increasing levels of acetylcholine in the brain (Emre & others, 2010; Howland, 2010; Orhan & others, 2009; Pepeu & Giovannini, 2009). Keep in mind, though, that the drugs used to treat Alzheimer disease only slow the downward progression of the disease; they do not treat its cause (Rafii & Aisen, 2009). These drugs slow the worsening of Alzheimer symptoms for approximately 6 to 12 months for about 50 percent of the individuals who take them (Alzheimer's Association, 2009). Also, no drugs have yet been approved by the Federal Drug Administration for the treatment of MCI (Alzheimer's Association, 2009).

Caring for Individuals with Alzheimer Disease A special concern is caring for patients with Alzheimer disease (Iliffe & others, 2009; Kelsey, Laditka, & Laditka, 2010; Silverstein, Wong, & Brueck, 2010). Health care professionals believe that the family can be an important support system for the Alzheimer patient, but this support can have costs for the family, who can become emotionally and physically drained by the extensive care required for a person with the disease (Elliott, Burglo, & Decoster, 2010; Ferrara & others, 2008; Lavretsky, Siddarth, & Irwin, 2010). For example, depression has been reported in 50 percent of family caregivers for patients with Alzheimer disease (Redinbaugh, MacCallum, & Kiecolt-Glaser, 1995). A meta-analysis found that female caregivers reported providing more caregiving hours and higher levels of burden and depression, as well as lower levels of well-being and physical health, than did male caregivers (Pinquart & Sorensen, 2006).

Respite care (services that provide temporary relief for those who are caring for individuals with disabilities, illnesses, or the elderly) has been developed to

connecting with careers

Jan Weaver, Director of the Alzheimer's Association of Dallas

Dr. Weaver joined the Alzheimer's Association, Greater Dallas Chapter, as director of services and education in 1999. Prior to that time, she served as associate director of education for the Texas Institute for Research and Education on Aging and the director of the National Academy for Teaching and Learning About Aging at the University of North Texas. As a gerontologist, Weaver plans and develops services and educational programs that address patterns of human development related to aging. Among the services that Weaver supervises at the Alzheimer's Association are a resource center and helpline, a family assistance program, a care program, support groups, referral and information, educational conferences, and community seminars.

Weaver recognizes that people of all ages should have an informed and balanced view of older adults that helps them perceive aging as a process of growth and fulfillment rather than a process of decline and dependency. Weaver earned her Ph.D. in sociology, with an emphasis in gerontology, from the University of Texas in 1996.

Jan Weaver giving a lecture on Alzheimer disease.

help people who have to meet the day-to-day needs of patients with Alzheimer disease. This type of care provides an important break away from the burden of providing chronic care (Tompkins & Bell, 2009). Researchers have recently found that the stress of caring for a patient with Alzheimer disease at home can prematurely age the immune system, putting caregivers at risk for developing age-related diseases (Graham, Christian, & Kiecolt-Glaser, 2006; Mausbach & others, 2008).

There are many career opportunities for working with individuals who have Alzheimer disease. To read about the work of a director of an Alzheimer association, see *Connecting With Careers*.

Multi-Infarct Dementia **Multi-infarct dementia** involves a sporadic and progressive loss of intellectual functioning caused by repeated temporary obstruction of blood flow in cerebral arteries (Solans-Laque & others, 2008; Thompson & others, 2010). The result is a series of mini-strokes. The term *infarct* refers to the temporary obstruction of blood vessels. It is estimated that 15 to 25 percent of dementias involve the vascular impairment of multi-infarct dementia.

Multi-infarct dementia is more common among men with a history of high blood pressure. The clinical picture of multi-infarct dementia is different from that of Alzheimer disease—many patients recover from multi-infarct dementia, whereas Alzheimer disease shows a progressive deterioration. The symptoms of multi-infarct dementia include confusion, slurring of speech, writing impairment, and numbness on one side of the face, arm, or leg (Hoyer & Roodin, 2009). However, after each occurrence, there usually is a rather quick recovery, although each succeeding occurrence is usually more damaging. Approximately 35 to 50 percent of individuals who have these transient attacks will have a major stroke within five years unless the underlying problems are treated. Especially recommended for these individuals are exercise, improved diet, and appropriate drugs, which can slow or stop the progression of the underlying vascular disease (Craft, 2009).

multi-infarct dementia Sporadic and progressive loss of intellectual functioning caused by repeated temporary obstruction of blood flow in cerebral arteries.

Parkinson Disease Another type of dementia is **Parkinson disease,** a chronic, progressive disease characterized by muscle tremors, slowing of movement, and partial facial paralysis. Parkinson disease is triggered by degeneration of dopamine-producing neurons in the brain (Swanson, Sesso, & Emborg, 2009). Dopamine is a neurotransmitter that is necessary for normal brain functioning. Why these neurons degenerate is not known.

The main treatment for Parkinson disease involves administering drugs that enhance the effect of dopamine (dopamine agonists) in the disease's earlier stages and later administering the drug L-dopa, which is converted by the brain into dopamine (LeWitt, 2009; Nagatsua & Sawadab, 2009; Pahwa & Wood, 2010; Wood, 2010). However, it is difficult to determine the correct level of dosage of L-dopa and it loses its efficacy over time (Nomoto & others, 2009).

Another treatment for advanced Parkinson disease is deep brain stimulation (DBS), which involves implantation of electrodes within the brain. The electrodes are then stimulated by a pacemaker-like device. Recent studies indicated that deep brain stimulation may provide benefits for individuals with Parkinson disease (Kim & others, 2010; Troster, 2009; Zahodne & others, 2009; Yuan & others, 2010). Other recent studies indicate that certain types of dance, such as the tango, can improve the movement skills of individuals with Parkinson disease (Hackney & Earhart, 2009, 2010a, b). Stem cell transplantation and gene therapy also offer hope for the future in treating the disease (Fricker-Gates & Gates, 2010; Isaacson & Kordower, 2009; Lindvall & Kokaia, 2010; Trimmer & Bennett, 2009).

BOYS & GIRLS CLUBS OF AMERICA

Muhammad Ali, one of the world's leading sports figures, has Parkinson disease.

FEAR OF VICTIMIZATION, CRIME, AND ELDER MALTREATMENT

Some of the physical decline and limitations that characterize development in late adulthood contribute to a sense of vulnerability and fear among older adults. For some older adults, the fear of crime may become a deterrent to travel, attendance at social events, and the pursuit of an active lifestyle. Almost one-fourth of older adults say they have a basic fear of being the victim of a crime. However, in reality, possibly because of the precautions they take, older adults are less likely than younger adults to be the victim of a crime. However, the crimes committed against older adults are likely to be serious offenses, such as armed robbery. Older adults are also victims of nonviolent crimes such as fraud, vandalism, purse snatching, and harassment (Fulmer, Guadagno, & Bolton, 2004). Estimates of the incidence of crimes against older adults may be low because older adults may not report crimes, fearing retribution from criminals or believing the criminal justice system cannot help them.

How often does elder abuse occur? A recent research review indicated that 6 percent of older adults reported experiencing significant abuse in the last month (Cooper, Selwood, & Livingston, 2008). In this study, 16 percent of home-care staff admitted to significant psychological abuse of older adults. Elder maltreatment may be perpetuated by anyone, but it is primarily carried out by family members (Dakin & Pearlmutter, 2009). As with child maltreatment, elder maltreatment can involve neglect, psychological abuse, or physical abuse (Anetzberger & Teaster, 2010; Mixson, 2010). Older adults are most often abused by their spouses. A special concern is the burden older women carry in facing possible physical violence. In the research review described above, 5.6 percent of older adult couples said they had experienced physical violence in their relationship in the last month.

Older adults also can experience *institutional abuse*, which involves mistreatment of older adults living in facilities such as nursing homes, hospitals, or long-term care (McDonald, 2007). Institutional abuse of older adults include the staff engaging in

Parkinson disease A chronic, progressive disease characterized by muscle tremors, slowing of movement, and partial facial paralysis.

connecting development to life

Meeting the Mental Health Needs of Older Adults

Older adults receive disproportionately fewer mental health services (Knight & Lee, 2007). One estimate is that only 2.7 percent of all clinical services provided by psychologists go to older adults, although individuals aged 65 and over make up more than 11 percent of the population. Psychotherapy can be expensive. Although reduced fees and sometimes no fee can be arranged in public hospitals for older adults from low-income backgrounds, many older adults who need psychotherapy do not get it (Knight & others, 2006). It has been said that psychotherapists like to work with young, attractive, verbal, intelligent, and successful clients (called YAVISes) rather than those who are quiet, ugly, old, institutionalized, and different (called QUOIDs). Psychotherapists have been accused of failing to see older adults because they perceive that older adults have a poor prognosis for therapy success; they do not feel they have adequate training to treat older adults, who may have special problems requiring special treatment; and they may have stereotypes that label older adults as low-status and unworthy recipients of treatment (Virnig & others, 2004).

How can we better meet the mental health needs of older adults? First, psychologists must be encouraged to include more older adults in their client lists, and older adults must be convinced that they can benefit from therapy. Second, we must make mental health care affordable. For example, Medicare continues to fall short of providing many mental health services for older adults, especially those in need of long-term care (Knight & Lee, 2007).

Margaret Gatz has been a crusader for better mental health treatment of older adults. She believes that mental health professionals need to be encouraged to include more older adults in their client lists and that we need to better educate the elderly about how they can benefit from therapy. *What are some common mechanisms of change that can be used to improve the mental health of older adults?*

Earlier in this chapter, we discussed stereotypes and ageism with regard to older adults in the workforce. How are those concepts related to what you just read in this interlude?

rough handling, hitting, or slapping patients, inappropriate treatment, and psychological abuse, such as social isolation and threats.

Maltreated older adults, as well as older adults who are depressed, have a dementia, or have another mental disorder, may need mental health treatment. To read about this topic, see *Connecting Development to Life*.

Review *Connect* Reflect

LG4 Describe mental health problems in older adults.

Review

- What is the nature of depression in older adults?
- What are dementia, Alzheimer disease, and other afflictions like in older adults?
- How extensive is fear of victimization, crime, and maltreatment in older adults?

Connect

- We also discussed depression in adolescence in Chapter 12. What are some differences in how depression is characterized in adolescence as opposed to late adulthood?

Reflect *Your Own Personal Journey of Life*

- Have any older adults in your family background experienced mental health problems as adults? If so, which mental health problems? If they have experienced mental health problems, what were the likely causes of the problems?

5 Religion

LG5 Explain the role of religion in the lives of older adults.

In Chapter 15, we discussed religion and meaning in life with a special focus on middle age, including links between religion and health. Here we will continue our exploration of religion by considering its importance in the lives of many older adults.

In many societies around the world, older adults are the spiritual leaders in their churches and communities. For example, in the Catholic Church more popes have been elected in their eighties than in any other 10-year period of the human life span.

The religious patterns of older adults have increasingly been studied (George, 2009; Krause, 2009; Levin, Chatters, & Taylor, 2010; Sapp, 2010). A recent study revealed that African American and Caribbean Black older adults reported higher levels of religious participation, religious coping, and spirituality than non-Latino White older adults (Taylor, Chatters, & Jackson, 2007). One recent study of rural older adults found that their spirituality/religiousness was linked to a lower incidence of depression (Yoon & Lee, 2007).

developmental **connection**

Stress. Meaning-making coping involves drawing on beliefs, values, and goals to change the meaning of a stressful situation, especially in times of chronic stress, as when a loved one dies. Chapter 15, p. 496

Is religion related to a sense of well-being and life satisfaction in old age? In one study it was. Interviews were conducted with 1,500 U.S. White and African American individuals 66 years of age and older (Krause, 2003). Older adults who derived a sense of meaning in life from religion had higher levels of life satisfaction, self-esteem, and optimism. Also, older African American adults were more likely to find meaning in religion than their White counterparts. In another study, religious practices—such as prayer and scripture reading—and religious feelings were associated with a sense of well-being, especially for women and individuals over 75 years of age (Koenig, Smiley, & Gonzales, 1988). In one study of low-income Latinos in San Diego, a strong religious orientation was associated with better health (Cupertino & Haan, 1999). And in two studies across an eight-year period, Mexican Americans aged 65 and older had slower rates of cognitive decline and a 32 percent reduction in risk of mortality compared to their counterparts who never attended church (Hill & others, 2005, 2006). Further, a recent study revealed that religious attendance at least weekly compared to never was linked to a lower risk of mortality (Gillum & others, 2008).

Religion can provide some important psychological needs in older adults, helping them face impending death, find and maintain a sense of meaningfulness and significance in life, and accept the inevitable losses of old age (Daaleman, Perera, & Studenski, 2004; McFarland, 2010). In one study, although church attendance decreased in older adults in their last year of life, their feelings of religiousness and the strength or comfort they received from religion were either stable or increased (Idler, Stanislav, & Hays, 2001). Socially, the religious community can provide a number of functions for older adults, such as social activities, social support, and the opportunity to assume teaching and leadership roles. Older adults can become deacons, elders, or religion teachers, assuming leadership roles they might have been unable to take on before they retired (Cox & Hammonds, 1988).

Might praying or meditating actually be associated with longevity? In one study, they were (McCullough & others, 2000). Nearly 4,000 women and men 65 years and older, mostly Christians, were asked about their health and whether they prayed or meditated. Those who said they rarely or never prayed had about a 50 percent greater risk of dying during the six-year study compared with those who prayed or meditated at least once a month. In this study, the researchers controlled for many factors known to place people at risk for dying, such

During late adulthood, many individuals increasingly engage in prayer. *How might this be linked with longevity?*

as smoking, drinking, and social isolation. It is possible that prayer and meditation lower the incidence of death in older adults because they reduce stress and dampen the body's production of stress hormones such as adrenaline. A decrease in stress hormones is linked with a number of health benefits, including a stronger immune system (McCullough & others, 2000).

Review *Connect* Reflect

LG5 Explain the role of religion in the lives of older adults.

Review

- What are some characteristics of religion in older adults?

Connect

- We just learned that prayer and meditation may reduce stress and dampen the body's production of stress hormones. Why is this especially important in the aging process?

Reflect *Your Own Personal Journey of Life*

- Do you think you will become more or less religious as an older adult? Explain.

topical **connections**

How individuals understand and cope with death and dying depends in part on their developmental level. Young children have a very limited understanding of death; not until they are about 9 years of age do they recognize death as final and irreversible. Adolescents tend to be self-conscious and often distance themselves from the finality of death. Middle-aged individuals become more aware of their own aging and often fear death more than younger and older adults. Grieving is common after a loved one dies and grieving is a complex process that can be positive or negative. A beneficial aspect of grieving is that it stimulates many people to try to make sense of their world.

looking ***forward***

Cognitive Development in Late Adulthood

1 Cognitive Functioning in Older Adults

LG1 Describe the cognitive functioning of older adults.

Multidimensionality and Multidirectionality

- Baltes emphasizes a distinction between cognitive mechanics (the neurophysiological architecture, including the brain) and cognitive pragmatics (the culture-based software of the mind). Cognitive mechanics are more likely to decline in older adults than are cognitive pragmatics. Researchers have found that speed of processing declines in older adults. Recently, the terms *fluid mechanics* and *crystallized pragmatics* have been used to describe cognitive mechanics and cognitive pragmatics, respectively.

  Some changes in attention take place in adulthood. In selective attention, older adults fare more poorly than younger adults in general; however, when tasks are simple and sufficient practice is given, age differences are minimal. Likewise, for divided attention, on simple tasks adult age differences are minimal, but on difficult tasks older adults do worse than younger adults. Older adults perform as well as younger adults on simple measures of sustained attention, less well on more complex tasks. Younger adults have better episodic memory than older adults. Regarding semantic memory, older adults have more difficulty retrieving semantic information, but they usually can eventually retrieve it. Researchers have found declines in working memory and perceptual speed in older adults. Older adults are more likely to show declines in explicit than in implicit memory. Prospective memory involves remembering what to do in the future, and the relation of prospective memory to aging is complex. An increasing number of studies are finding that people's beliefs about memory play an important role in their memory performance. Noncognitive factors such as health, education, and socioeconomic status are linked with memory in older adults.

  Decision making is reasonably well preserved in older adults. Wisdom is expert knowledge about the practical aspects of life that permits excellent judgment about important matters. Baltes and his colleagues have found that high levels of wisdom are rare, the time frame of late adolescence and early adulthood is the main window for wisdom to emerge, factors other than age are critical for wisdom to develop, and personality-related factors are better predictors of wisdom than cognitive factors such as intelligence. Sternberg argues that wisdom involves both academic and practical aspects of intelligence. His balance theory emphasizes making competent decisions that take into account self-interest, the interests of others, and contexts to produce a common good.

Education, Work, and Health

- Successive generations of Americans have been better educated. Education is positively correlated with scores on intelligence tests. Older adults may return to education for a number of reasons. Successive generations have had work experiences that include a stronger emphasis on cognitively oriented labor. The increased emphasis on information processing in jobs likely enhances an individual's intellectual abilities. Poor health is related to decreased performance on intelligence tests in older adults. Exercise is linked to higher cognitive functioning in older adults.

Use It or Lose It

- Researchers are finding that older adults who engage in cognitive activities, especially challenging ones, have higher cognitive functioning that those who don't use their cognitive skills.

Training Cognitive Skills

- Two main conclusions can be derived from research on training cognitive skills in older adults: (1) Training can improve the cognitive skills of many older adults, and (2) there is some loss in plasticity in late adulthood.

Cognitive Neuroscience and Aging

- There has been considerable recent interest in the cognitive neuroscience of aging that focuses on links among aging, the brain, and cognitive functioning. This field especially relies on fMRI and PET scans to assess brain functioning while individuals are engaging in cognitive tasks. One of the most consistent findings in this field is a decline in the functioning of specific regions in the prefrontal cortex in older adults and links between this decline and poorer performance on complex reasoning, working memory, and episodic memory tasks.

2 Language Development

LG2 Characterize changes in language in older adults.

- For many individuals, knowledge of words and word meanings continues unchanged or may even improve in late adulthood. However, some decline in language skills may occur in retrieving words for use in conversation, understanding speech, phonological skills, and some aspects of discourse. These changes in language skills in older adults likely occur as a consequence of declines in hearing or memory, or in the speed of processing information, or as a result of disease.

3 Work and Retirement

LG3 Discuss aging and adaptation to work and retirement.

Work

- Today, the percentage of men over 65 who continue to work full-time is less than at the beginning of the 20th century. An important change in older adults' work patterns is the increase in part-time work. Some individuals continue a life of strong work productivity throughout late adulthood.

Retirement in the United States and in Other Countries

- A retirement option for older workers is a late-20th-century phenomenon in the United States.

Adjustment to Retirement

- The pathways individuals follow when they reach retirement age today are less clear than in the past. Adjusting best to retirement are individuals who are healthy, have adequate income, are active, are better educated, have an extended social network of friends and family, and are satisfied with their lives before they retire.

4 Mental Health

LG4 Describe mental health problems in older adults.

Depression

- Depression has been called the "common cold" of mental disorders. However, a majority of older adults with depressive symptoms never receive mental health treatment.

Dementia, Alzheimer Disease, and Other Afflictions

- Dementia is a global term for any neurological disorder in which the primary symptoms involve a deterioration of mental functioning. Alzheimer disease is by far the most common dementia. This progressive, irreversible disorder is characterized by gradual deterioration of memory, reasoning, language, and eventually physical functioning. Special efforts are being made to discover the causes of Alzheimer disease and effective treatments for it. The increase in amyloid plaques and neurofibrillary tangles in Alzheimer patients may hold important keys to improving our understanding of the disease. Alzheimer disease is characterized by a deficiency in acetylcholine that affects memory. Also, in Alzheimer disease the brain shrinks and deteriorates as plaques and tangles form. Important concerns are caring for Alzheimer patients and the burdens this places on caregivers. In addition to Alzheimer disease, other types of dementia are multi-infarct dementia and Parkinson disease.

Fear of Victimization, Crime, and Elder Maltreatment

- Some of the physical decline and limitations that characterize development in late adulthood contribute to a sense of vulnerability and fear among older adults. Almost one-fourth of older adults say they have a basic fear of being the victim of a crime. Older women are more likely than older men to be victimized or abused.

5 Religion

LG5 Explain the role of religion in the lives of older adults.

- Many older adults are spiritual leaders in their church and community. Religious interest increases in old age and is related to a sense of well-being in the elderly.

key terms

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chapter 19

SOCIOEMOTIONAL DEVELOPMENT IN LATE ADULTHOOD

chapter **outline**

1 Theories of Socioemotional Development

Learning Goal 1 Discuss four theories of socioemotional development and aging.

Erikson's Theory
Activity Theory
Socioemotional Selectivity Theory
Selective Optimization With Compensation Theory

2 Personality, the Self, and Society

Learning Goal 2 Describe links between personality and mortality, and identify changes in the self and society in late adulthood.

Personality
The Self and Society
Older Adults in Society

3 Families and Social Relationships

Learning Goal 3 Characterize the families and social relationships of aging adults.

Lifestyle Diversity
Older Adult Parents and Their Adult Children
Great-Grandparenting
Friendship
Social Support and Social Integration
Altruism and Volunteerism

4 Ethnicity, Gender, and Culture

Learning Goal 4 Summarize how ethnicity, gender, and culture are linked with aging.

Ethnicity
Gender
Culture

5 Successful Aging

Learning Goal 5 Explain how to age successfully.

Bob Cousy was a star player on Boston Celtics teams that won numerous National Basketball Association championships. In recognition of his athletic accomplishments, Cousy was honored by ESPN as one of the top 100 athletes of the 20th century. After he retired from basketball, he became a college basketball coach and then into his seventies was a broadcaster of Boston Celtics basketball games. Now in his eighties, Cousy has retired from broadcasting but continues to play golf and tennis on a regular basis. He has a number of positive social relationships, including a marriage of more than 50 years, children and grandchildren, and many friends.

As is the case with many famous people, their awards usually reveal little about their personal lives and contributions. Two examples illustrate his humanitarian efforts to help others (McClellan, 2004). First, Cousy played for the Boston Celtics, his African American teammate, Chuck Cooper, was refused a room on a road trip because of his race. Cousy expressed anger to his coach about the situation and then accompanied an appreciative Cooper on a train back to Boston. Second, "Today the Bob Cousy Humanitarian Fund honors individuals who have given their lives to using the game of basketball as a medium to help others" (p. 4). The Humanitarian Fund reflects Cousy's motivation to care for others, be appreciative and give something back, and make the world less self-centered.

YOU'LL KNOW IT WHEN YOU HAVE
CELTI
14
BOSTON CELTICS
1957 WORLD CHAMPIONS

Bob Cousy, as a Boston Celtics star when he was a young adult (*left*) and as an older adult (*right*). *What are some changes he has made in his life as an older adult?*

topical **connections**

Middle adulthood is a time when individuals become more conscious of the young-old polarity in life and the shrinking amount of time left in their lives. And it is a time when individuals seek to transmit something meaningful to the next generation. The concept of mid-life crisis has been exaggerated; when people do experience this crisis, it often is linked to negative life events. The stability of personality peaks in middle adulthood and marital satisfaction often increases at this time. Many middle-aged adults become grandparents and the middle-aged generation plays a key role in intergenerational relationships, with middle-aged women especially connecting generations.

looking ***back***

preview

Bob Cousy's life as an older adult reflects some of the themes of socioemotional development in older adults that we will discuss in this chapter. These include the important role that being active plays in life satisfaction, adapting to changing skills, and the positive role of close relationships with friends and family in an emotionally fulfilling life.

1 Theories of Socioemotional Development

LG1 Discuss four theories of socioemotional development and aging.

- Erikson's Theory
- Activity Theory
- Socioemotional Selectivity Theory
- Selective Optimization With Compensation Theory

We will explore four main theories of socioemotional development that focus on late adulthood: Erikson's theory, activity theory, socioemotional selectivity theory, and selective optimization with compensation theory.

ERIKSON'S THEORY

We initially discussed Erik Erikson's (1968) eight stages of the human life span in Chapter 1, and as we explored different periods of development in this book, we examined the stages in more detail. Here we will discuss his final stage.

developmental **connection**

Cognitive Theory. Erikson's other two adult stages are intimacy versus isolation (early adulthood) and generativity versus stagnation (middle adulthood). Chapter 14, p. 452; Chapter 16, p. 503

Integrity Versus Despair **Integrity versus despair** is Erikson's eighth and final stage of development, which individuals experience during late adulthood. This stage involves reflecting on the past and either piecing together a positive review or concluding that one's life has not been well spent. Through many different routes, the older adult may have developed a positive outlook in each of the preceding periods. If so, retrospective glances and reminiscences will reveal a picture of a life well spent, and the older adult will be satisfied (integrity). But if the older adult resolved one or more of the earlier stages in a negative way (being socially isolated in early adulthood or stagnated in middle adulthood, for example), retrospective glances about the total worth of his or her life might be negative (despair). Figure 19.1 portrays how positive resolutions of Erikson's eight stages can culminate in wisdom and integrity for older adults.

Life Review Life review is prominent in Erikson's final stage of integrity versus despair. Life review involves looking back at one's life experiences, evaluating them, interpreting them, and often reinterpreting them (George, 2010; Robitaille & others, 2010). A leading expert on aging, Robert Butler, recently provided this perspective on life review: ". . . there are chances for pain, anger, guilt, and grief, but there are also opportunities for resolution and celebration, for affirmation and hope, for reconciliation and personal growth" (Butler, 2007, p. 72).

Butler (2007) states that the life review is set in motion by looking forward to death. Sometimes the life review proceeds quietly; at other times it is intense, requiring considerable work to achieve some sense of personality integration. The life review may be observed initially in stray and insignificant thoughts about oneself and one's life history. These thoughts may continue to emerge in brief intermittent spurts or become essentially continuous. One 76-year-old man commented, "My life is in the back of my mind. It can't be any other way. Thoughts of the past play on me. Sometimes I play with them, encouraging and savoring them; at other times I dismiss them."

integrity versus despair Erikson's eighth and final stage of development, which individuals experience in late adulthood. This involves reflecting on the past and either piecing together a positive review or concluding that one's life has not been well spent.

Conflict and Resolution	Culmination in Old Age
Old age Integrity vs. despair: wisdom	Existential identity; a sense of integrity strong enough to withstand physical disintegration.
Middle adulthood Generativity vs. stagnation: care	Caring for others, and empathy and concern.
Early adulthood Intimacy vs. isolation: love	Sense of complexity of relationships; value of tenderness and loving freely.
Adolescence Identity vs. confusion: fidelity	Sense of complexity of life; merger of sensory, logical, and aesthetic perception.
School age Industry vs. inferiority: competence	Humility; acceptance of the course of one's life and unfulfilled hopes.
Early childhood Initiative vs. guilt: purpose	Humor; empathy; resilience.
Toddlerhood Autonomy vs. shame: will	Acceptance of the cycle of life, from integration to disintegration.
Infancy Basic trust vs. mistrust: hope	Appreciation of interdependence and relatedness.

FIGURE **19.1**

ERIKSON'S VIEW OF HOW POSITIVE RESOLUTION OF THE EIGHT STAGES OF THE HUMAN LIFE SPAN CAN CULMINATE IN WISDOM AND INTEGRITY IN OLD AGE. In Erikson's view, each stage of life is associated with a particular psychosocial conflict and a particular resolution. In this chart, Erikson describes how the issue from each of the earlier stages can mature into the many facets of integrity and wisdom in old age. At left, Erikson is shown with his wife Joan, an artist.

Life reviews can include sociocultural dimensions, such as culture, ethnicity, and gender. Life reviews also can include interpersonal, relationship dimensions, including sharing and intimacy with family members or a friend (Cappeliez & O'Rourke, 2006). And life reviews can include personal dimensions, which might involve the creation and discovery of meaning and coherence. These personal dimensions might unfold in such a way that the pieces do or don't make sense to the older adult. In the final analysis, each person's life review is to some degree unique.

As the past marches in review, the older adult surveys it, observes it, and reflects on it. Reconsideration of previous experiences and their meaning occurs, often with revision or expanded understanding taking place. This reorganization of the past may provide a more valid picture for the individual, providing new and significant meaning to one's life. It may also help prepare the individual for death, in the process reducing fear (Cappeliez, O'Rourke, & Chaudhury, 2005). A recent study revealed that one particular life-review course, "Looking for Meaning," reduced the depressive symptoms of middle-aged and older adults (Pot & others, 2010).

One aspect of life review involves identifying and reflecting on not only the positive aspects of one's life but also on regrets as part of developing a mature wisdom and self-understanding (Choi & Jun, 2009). The hope is that by examining not only the positive aspects of one's life, but also what an individual has regretted doing, a more accurate vision of the complexity of one's life and possibly increased life satisfaction will be attained (King & Hicks, 2007).

Following is a sampling of recent studies on regrets in older adults:

- For low-income older adults, regrets about education, careers, and marriage were common, but the intensity of regrets was greater for finance/money, family conflict and children's problems, loss and grief, and health (Choi & Jun, 2009). Common indications of pride involved children and parenting, careers, volunteering/informal caregiving, having a long/strong marriage, and personal growth.

What characterizes a life review in late adulthood?

- Making downward social comparisons, such as "I'm better off than most people," was linked to a reduction in the intensity of regrets in older adults (Bauer, Wrosch, & Jobin, 2008).
- Following the death of a loved one, resolving regrets was related to lower depression and improved well-being (Torges, Stewart, & Nolen-Hoesksema, 2008). In this study, older adults were more likely to resolve their regrets than were younger adults.

Some clinicians use *reminiscence therapy* with their older clients. Reminiscence therapy involves discussing past activities and experiences with another individual or group (Peng & others, 2009). The therapy may include the use of photographs, familiar items, and video/audio recordings. Researchers have found that reminiscence therapy improves the mood of older adults (Fiske, Wetherell, & Gatz, 2009). In fact, one study of institutionalized older adults revealed that reminiscence therapy increased their life satisfaction and decreased their depression and loneliness (Chiang & others, 2010).

Should adults stay active or become more disengaged as they become older? Explain.

ACTIVITY THEORY

Activity theory states that the more active and involved older adults are, the more likely they are to be satisfied with their lives. Researchers have found strong support for activity theory, beginning in the 1960s and continuing into the 21st century (Neugarten, Havighurst, & Tobin, 1968; Riebe & others, 2005). These researchers have found that when older adults are active, energetic, and productive, they age more successfully and are happier than if they disengage from society.

Activity theory suggests that many individuals will achieve greater life satisfaction if they continue their middle-adulthood roles into late adulthood. If these roles are stripped from them (as in early retirement), it is important for them to find substitute roles that keep them active and involved.

SOCIOEMOTIONAL SELECTIVITY THEORY

Socioemotional selectivity theory states that older adults become more selective about their social networks. Because they place a high value on emotional satisfaction, older adults spend more time with familiar individuals with whom they have had rewarding relationships. Developed by Laura Carstensen (1998, 2006, 2008), this theory states that older adults deliberately withdraw from social contact with individuals peripheral to their lives while they maintain or increase contact with close friends and family members with whom they have had enjoyable relationships. This selective narrowing of social interaction maximizes positive emotional experiences and minimizes emotional risks as individuals become older.

Socioemotional selectivity theory challenges the stereotype that the majority of older adults are in emotional despair because of their social isolation (Charles & Carstensen, 2009, 2010; Scheibe & Carstensen, 2010). Rather, older adults consciously choose to decrease the total number of their social contacts in favor of spending increasing time in emotionally rewarding moments with friends and family. That is, they systematically hone their social networks so that available social partners satisfy their emotional needs.

Is there research evidence to support life-span differences in the composition of social networks? Researchers have found that older adults have far smaller social networks than younger adults (Charles & Carstensen, 2010). In one study of individuals 69 to 104 years of age, the oldest participants had fewer peripheral social

activity theory The theory that the more active and involved older adults are, the more likely they are to be satisfied with their lives.

socioemotional selectivity theory The theory that older adults become more selective about their social networks. Because they place a high value on emotional satisfaction, older adults often spend more time with familiar individuals with whom they have had rewarding relationships.

contacts than the relatively younger participants but about the same number of close emotional relationships (Lang & Carstensen, 1994). In another study, compared with younger adults, older adults reported the most intense positive emotions with family members, less intense positive emotions with established friends, and the least intense positive emotions with new friends (Charles & Piazza, 2007).

Socioemotional selectivity theory also focuses on the types of goals that individuals are motivated to achieve (Charles & Carstensen, 2009, 2010). It states that two important classes of goals are (1) knowledge-related and (2) emotional. This theory emphasizes that the trajectory of motivation for knowledge-related goals starts relatively high in the early years of life, peaking in adolescence and early adulthood, and then declining in middle and late adulthood (see Figure 19.2). The emotion trajectory is high during infancy and early childhood, declines from middle childhood through early adulthood, and increases in middle and late adulthood.

Laura Carstensen. Her theory of socioemotional selectivity is gaining recognition as an important theory.

One of the main reasons given for these changing trajectories in knowledge-related and emotion-related goals involves the perception of time (Carstensen, 2006). When time is perceived as open-ended, as it is when individuals are younger, people are more strongly motivated to pursue information, even at the cost of emotional satisfaction. But as older adults perceive that they have less time left in their lives, they are motivated to spend more time pursuing emotional satisfaction. Are older adults more emotionally satisfied though? To read further about how emotion changes across the life span, see *Connecting Through Research* on the next page.

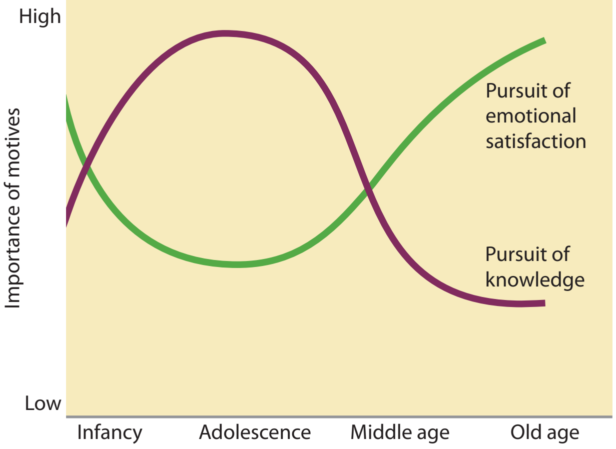

FIGURE **19.2**

IDEALIZED MODEL OF SOCIOEMOTIONAL SELECTIVITY THROUGH THE LIFE SPAN. In Carstensen's theory of socioemotional selectivity, the motivation to reach knowledge-related and emotion-related goals changes across the life span.

SELECTIVE OPTIMIZATION WITH COMPENSATION THEORY

Selective optimization with compensation theory states that successful aging is linked with three main factors: selection, optimization, and compensation (SOC). The theory describes how people can produce new resources and allocate them effectively to the tasks they want to master (Freund & Lamb, 2011; Riediger, Li, & Lindenberger, 2006; Staudinger & Jacobs, 2011). *Selection* is based on the concept that older adults have a reduced capacity and loss of functioning, which require a reduction in performance in most life domains. *Optimization* suggests that it is possible to maintain performance in some areas through continued practice and the use of new technologies. *Compensation* becomes relevant when life tasks require a level of capacity beyond the current level of the older adult's performance potential. Older adults especially need to compensate in circumstances with high mental or physical demands, such as when thinking about and memorizing new material very fast, reacting quickly when driving a car, or running fast. When older adults develop an illness, the need for compensation is obvious.

Selective optimization with compensation theory was proposed by Paul Baltes and his colleagues (Baltes, 2003; Baltes, Lindenberger, & Staudinger, 2006). They describe the life of the late Arthur Rubinstein to illustrate their theory. When he was interviewed at 80 years of age, Rubinstein said that three factors were responsible for his ability to maintain his status as an admired concert pianist into old age. First, he mastered the weakness of old age by reducing the scope of his performances and playing fewer pieces (which reflects selection). Second, he spent more time at practice than earlier in his life (which reflects optimization). Third, he used special strategies, such as slowing down before fast segments, thus creating the image of faster playing (which reflects compensation).

developmental **connection**

Life-Span Perspective. Baltes proposed eight main characteristics of the life-span perspective, one of which is: Development involves growth, maintenance, and regulation of loss. Chapter 1, p. 7

selective optimization with compensation theory The theory that successful aging is related to three main factors: selection, optimization, and compensation.

connecting through research

How Do Emotions Change Across Adulthood?

One study examined how emotion changes across the adulthood years in 2,727 persons from 25 to 74 years of age in the United States (Mroczek & Kolarz, 1998). Participants completed a survey that assessed the frequency of their positive and negative emotions over a 30-day time frame. Two six-item scales were created, one for positive emotion, the other for negative emotion. Participants rated each of the following items from 1 = none of the time to 5 = all of the time:

Positive Affect

1. Cheerful
2. In good spirits
3. Extremely happy
4. Calm or peaceful
5. Satisfied
6. Full of life

Negative Affect

1. So sad nothing could cheer you up
2. Nervous
3. Restless or fidgety
4. Hopeless
5. That everything was an effort
6. Worthless

Thus, scores could range from 6 to 30 for positive affect and for negative affect.

The results were that older adults reported experiencing more positive emotion and less negative emotion than younger adults, and the increase in positive emotion with age in adults increased at an accelerating rate (see Figure 19.3). In sum, researchers have found that the emotional life of older adults is more positive than once believed (Mroczek, 2001; Scheibe & Carstensen, 2010).

Researchers in another study found that across diverse samples (Norwegians, Catholic nuns, African Americans, Chinese Americans, and European Americans) older adults report better control of their emotions and fewer negative emotions than younger adults (Mroczek, 2001). For example, one recent study revealed that older adults said they experience less intense negative emotions with family members, established friends, and new friends than younger adults reported (Charles & Piazza, 2007). Consider also these two recent studies: In one study, older adults socialized more frequently with their neighbors than middle-aged adults did (Cornwell, Laumann, & Schumm, 2008); in the other study, older adults described their own emotions and the emotions of others more positively than younger adults did (Lockenhoff, Costa, & Lane, 2008).

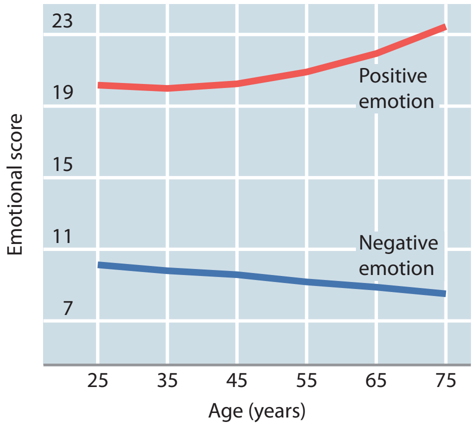

FIGURE **19.3**

CHANGES IN POSITIVE AND NEGATIVE EMOTION ACROSS THE ADULT YEARS. Positive and negative scores had a possible range of 6 to 30 with higher scores reflecting positive emotion and lower scores negative emotion. Positive emotion increased in the middle adulthood and late adulthood years while negative emotion declined.

Thus, compared with younger adults, the feelings of older adults mellow (Charles & Carstensen, 2009, 2010; Scheibe & Carstensen, 2010). Emotional life is on a more even keel with fewer highs and lows. It may be that although older adults have less extreme joy, they have more contentment, especially when they are connected in positive ways with friends and family.

The process of selective optimization with compensation is likely to be effective whenever people pursue successful outcomes (Freund & Lamb, 2011; Staudinger & Jacobs, 2011). What makes SOC attractive to aging researchers is that it makes explicit how individuals can manage and adapt to losses. By using SOC, they can continue to live satisfying lives, although in a more restrictive manner. Loss is a common dimension of old age, although there are wide variations in the nature of the losses involved. Because of this individual variation, the specific form of selection, optimization, and compensation will likely vary, depending on the person's life history, pattern of interests, values, health, skills, and resources. To read about some strategies for effectively engaging in selective optimization with compensation, see *Connecting Development to Life*.

In Baltes' view (2003; Baltes, Lindenberger, & Staudinger, 2006), the selection of domains and life priorities is an important aspect of development. Life goals and

connecting development to life

Strategies for Effectively Engaging in Selective Optimization With Compensation

What are some good strategies that aging adults can engage in to attain selective optimization with compensation? According to Paul Baltes and his colleagues (Baltes, Lindenberger, & Staudinger, 2006; Freund & Baltes, 2002), these strategies are likely to be effective:

Selection Strategies

- Focus on the most important goal at a particular time.
- Think about what you want in life and commit yourself to one or two major goals.
- To reach a particular goal, you may need to abandon other goals.

Optimization Strategies

- Keep working on what you have planned until you are successful.
- Persevere and keep trying until you reach your goal.
- When you want to achieve something, you may need to be patient until the right moment arrives.

Compensation Strategies

- When things don't go the way they used to, search for other ways to achieve what you want.
- If things don't go well for you, be willing to let others help you.
- When things don't go as well as in the past, keep trying other ways until you can achieve results that are similar to what you accomplished earlier in your life.

How might you revise these guidelines to include the use of new technologies?

priorities likely vary across the life course for most people. For many individuals, it is not just the sheer attainment of goals, but rather the attainment of *meaningful* goals, that makes life satisfying.

A cross-sectional study by Ursula Staudinger (1996) assessed the personal life investments of 25- to 105-year-olds (see Figure 19.4). From 25 to 34 years of age, participants said that they personally invested more time in work, friends, family,

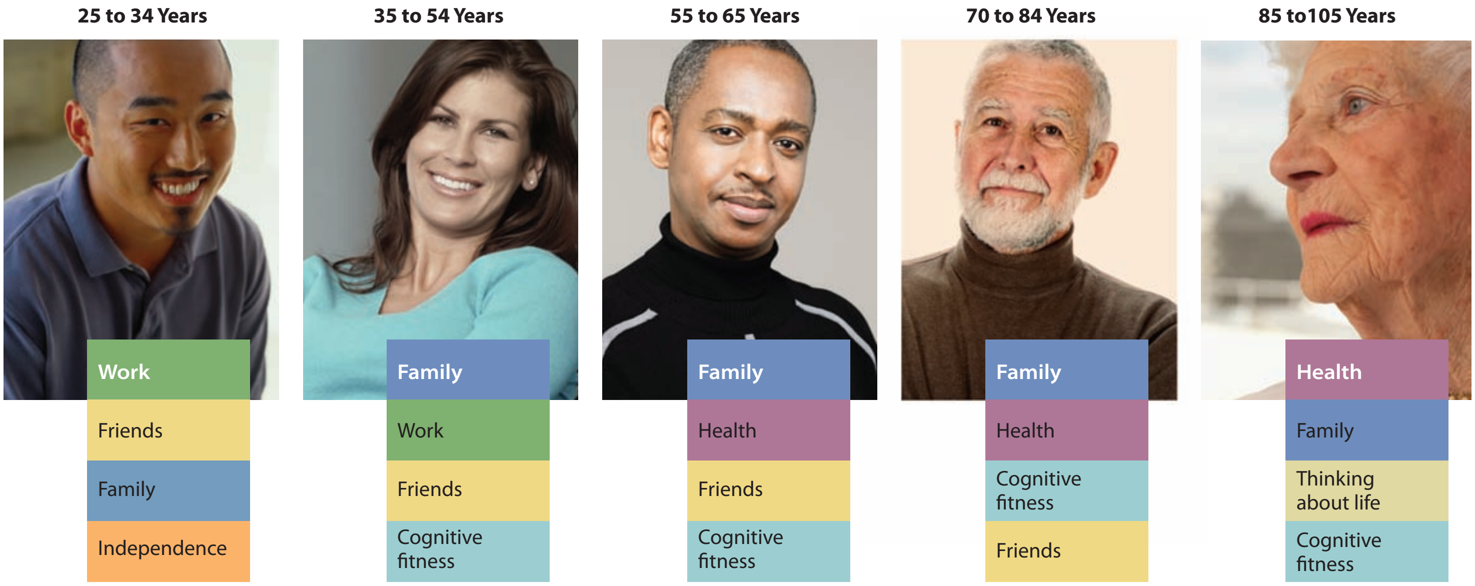
25 to 34 Years
Work
Friends
Family
Independence
35 to 54 Years
Family
Work
Friends
Cognitive fitness
55 to 65 Years
Family
Health
Friends
Cognitive fitness
70 to 84 Years
Family
Health
Cognitive fitness
Friends
85 to105 Years
Health
Family
Thinking about life
Cognitive fitness

FIGURE **19.4**

DEGREE OF PERSONAL LIFE INVESTMENT AT DIFFERENT POINTS IN LIFE. Shown here are the top four domains of personal life investment at different points in life. The highest degree of investment is listed at the top (for example, work was the highest personal investment from 25 to 34 years of age, family from 35 to 84, and health from 85 to 105).

and independence, in that order. From 35 to 54 and 55 to 65 years of age, family became more important than friends to them in terms of their personal investment. Little changed in the rank ordering of persons 70 to 84 years old, but for participants 85 to 105 years old, health became the most important personal investment. Thinking about life showed up for the first time on the most important list for those who were 85 to 105 years old.

One point to note about the study just described is the demarcation of late adulthood into the subcategories of 70 to 84 and 85 to 105 years of age. This fits with our comments on a number of occasions in this book that researchers increasingly recognize the importance of comparing older adults of different ages rather than studying them as one age group.

Review *Connect* Reflect

LG1 Discuss four theories of socioemotional development and aging.

Review

- What is Erikson's theory of late adulthood?
- What is activity theory?
- What is socioemotional selectivity theory?
- What is selective optimization with compensation theory?

Connect

- How does the life reflection of older adults differ from the life reflection of individuals in middle adulthood when approaching retirement age?

Reflect *Your Own Personal Journey of Life*

- Which of the four theories best describes the lives of older adults you know? Explain.

2 Personality, the Self, and Society

LG2 Describe links between personality and mortality, and identify changes in the self and society in late adulthood.

Personality

The Self and Society

Older Adults in Society

Some personality traits change in late adulthood? Is personality linked to mortality in older adults? Do self-perceptions and self-control change in late adulthood? How are older adults perceived and treated by society?

PERSONALITY

We described the Big Five factors of personality in Chapter 16, "Socioemotional Development in Middle Adulthood." Researchers have found that several of the Big Five factors of personality continue to change in late adulthood. For example, in one study conscientiousness continued to develop in late adulthood (Roberts, Walton, & Bogg, 2005), and in another study older adults were more conscientious and agreeable than middle-aged and younger adults (Allemand, Zimprich, & Hendriks, 2008).

developmental **connection**

Personality. The Big Five factors of personality are openness, conscientiousness, extraversion, agreeableness, and neuroticism. Chapter 16, p. 511

Might certain personality traits be related to how long older adults live? Researchers have found that some personality traits are associated with the mortality of older adults. A longitudinal study of more than 1,200 individuals across seven decades revealed that the Big Five personality factor of conscientiousness predicted higher mortality risk from childhood through late adulthood (Martin, Friedman, & Schwartz, 2007). Another study found that two of the Big Five factors were linked to older adults' mortality in one study, with low conscientiousness and high neuroticism predicting earlier death (Wilson & others, 2004). And in a five-year longitudinal study higher levels of conscientiousness, extraversion, and openness were related to higher mortality risk (Iwasa & others, 2008).

Following are the results of two other recent studies of the Big Five factors in older adults:

- One study examined developmental changes in the components of conscientiousness (Jackson & others, 2009). In this study, the transition into late adulthood was characterized by increases in these aspects of conscientiousness: impulse control, reliability, and conventionality.
- A study revealed that poor decision making in older adults was linked to the Big Five factor of neuroticism (Denburg & others, 2009).

Affect and outlook on life are also linked to mortality in older adults (Chida & Steptoe, 2008; Mroczek, Spiro, & Griffin, 2006). Older adults characterized by negative affect don't live as long as those who display more positive affect, and optimistic older adults who have a positive outlook on life live longer than their counterparts who are more pessimistic and have a negative outlook on life (Levy & others, 2002).

THE SELF AND SOCIETY

Our exploration of the self focuses on changes in self-esteem, possible selves, self-acceptance, and self-control. In Chapter 12, we described how self-esteem drops in adolescence, especially for girls. How does self-esteem change in the adult years?

Self-Esteem In the cross-sectional study of self-esteem described in Chapter 12, a very large, diverse sample of more than 300,000 individuals from 9 to 90 were assessed (Robins & others, 2002). About two-thirds of the participants were from the United States. The individuals were asked to respond to the item "I have high self-esteem" on the following 5-point scale:

1	2	3	4	5
Strongly Disagree				Strongly Agree

Self-esteem increased in the twenties, leveled off in the thirties and forties, rose considerably in the fifties and sixties, and then dropped significantly in the seventies and eighties (see Figure 19.5). Through most of the adult years, the self-esteem of males was higher than the self-esteem of females. However, in the seventies and eighties, the self-esteem of males and females converged.

Why might self-esteem decline in older adults? Explanations include deteriorating physical health and negative societal attitudes toward older adults, although

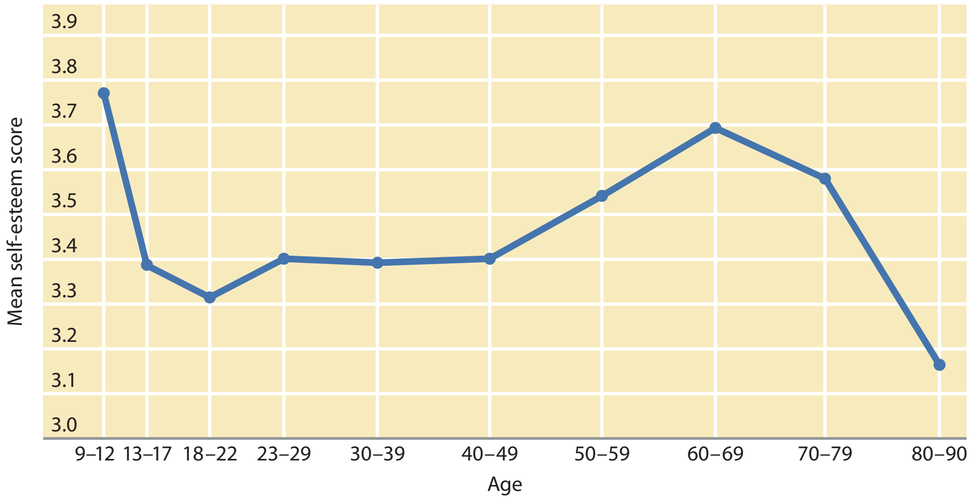

FIGURE **19.5**

SELF-ESTEEM ACROSS THE LIFE SPAN. One cross-sectional study found that self-esteem was high in childhood, dropped in adolescence, increased through early and middle adulthood, then dropped in the seventies and eighties (Robins & others, 2002). More than 300,000 individuals were asked the extent to which they have high self-esteem on a 5-point scale, with 5 being "Strongly Agree" and 1 being "Strongly Disagree."

these factors were not examined in the large-scale study just described. Researchers have found that in late adulthood, being widowed, institutionalized, or physically impaired, having a low religious commitment, and experiencing a decline in health are linked to low self-esteem (Giarrusso & Bengtson, 2007).

I am the family face;
Flesh perishes,
I live on,
Projecting trait and trace
Through time to times anon,
And leaping from place to place
Over oblivion.

—Thomas Hardy

English Novelist and Poet,
19th Century

Is self-esteem more stable at some points in the life span than at others? A meta-analysis revealed that self-esteem was the least stable in early childhood (Trzesniewski, Donnellan, & Robins, 2003). One reason for this may be that young children don't completely understand the questions they are asked about their self-esteem but rather provide responses based on their current mood. The stability of self-esteem increased in late adolescence and early adulthood. By late adolescence, individuals are experiencing less dramatic physical changes (compared with pubertal change, for example) and are able to better engage in self-control that likely contributed to the increase in stability of self-esteem. The stability of self-esteem decreased in late adulthood, a time during which dramatic life changes and shifting social circumstances (such as death of a loved one and deteriorating health) may occur.

Although older adults may derive self-esteem from earlier successes in some domains, such as work and family, some aspects of their lives require continued support for self-esteem (Smith, 2009). For example, older adults' self-esteem benefits from being told they are nice and accepted by others.

Possible Selves **Possible selves** are what individuals might become, what they would like to become, and what they are afraid of becoming (Hoppmann & Smith, 2007; Markus & Nurius, 1987). Acceptance of ideal and future selves decreases and acceptance of past selves increases in older adults (Ryff, 1991).

One recent study of older adults (mean age of 81) revealed that hope-related activities had more positive effect and a higher probability of survival over a 10-year period (Hoppmann & others, 2007). Also in this study, hoped-for selves were linked to more likely participation in these domains. Another study of older adults 70 to 100-plus years found that over time 72 percent of the older adults added new domains of hope and 53 percent added new fears (Smith & Freund, 2002). In this study, hopes and fears about health were reported more often than ones related to family and social relationships. Also, for some individuals, as middle-aged adults, their possible selves center on attaining hoped-for selves, such as acquiring material possessions, but as older adults, they become more concerned with maintaining what they have and preventing or avoiding health problems and dependency (Smith, 2009).

A recent study in 21 countries revealed that older adults in Denmark reported the strongest control over their lives (HSBC Insurance, 2007).

possible selves What individuals might become, what they would like to become, and what they are afraid of becoming.

Self-Control Although older adults are aware of age-related losses, most still effectively maintain a sense of self-control (Lewis, Todd, & Xu, 2011). A recent survey across a range of 21 developed and developing countries revealed that a majority of adults in their sixties and seventies reported being in control of their lives (HSBC Insurance, 2007). In developed countries such as Denmark, the United States, and Great Britain, adults in their sixties and seventies said they had more control over their lives than their counterparts in their forties and fifties. Older adults in Denmark reported the highest self-control.

The negative effects of age-typical problems, such as a decline in physical and cognitive skills and an increase in illness, may be buffered by a flexible, accommodating control style. Researchers have found that *accommodating control strategies* (changing one's goals to fit a given circumstance) increase in importance, and *assimilative control strategies* (changing a situation to meet one's goals) decrease in importance beginning in middle adulthood (Brandstädter & Renner, 1990).

However, it is important to consider not just general self-control but how people self-regulate their behavior in specific areas of their lives. One study examined individuals from 13 to 90 years of age. For the oldest group (60 to 90 years of age), self-control was lowest in the physical domain; for the youngest group (13 to 18 years of age), it was lowest in the social domain (Bradley & Webb, 1976). Other researchers have found a decline in perceived self-control in cognitive functioning in older adults (Bertrand & Lachman, 2003).

OLDER ADULTS IN SOCIETY

Does society negatively stereotype older adults? What are some social policy issues in an aging society?

Stereotyping Older Adults Social participation by older adults is often discouraged by **ageism,** which is prejudice against others because of their age, especially prejudice against older adults (Leifheit-Limson & Levy, 2009). They are often perceived as incapable of thinking clearly, learning new things, enjoying sex, contributing to the community, or holding responsible jobs. Many older adults face painful discrimination and might be too polite and timid to attack it. Because of their age, older adults might not be hired for new jobs or might be eased out of old ones; they might be shunned socially; and they might be edged out of their family life.

The personal consequences of negative stereotyping about aging can be serious (Roberts, 2008). A physician (60 years old himself) told an 80-year-old: "Well, of course, you are tired. You just need to slow down. Don't try to do so much. After all you are very old." Many older adults accept this type of advice even though it is rooted in age stereotyping rather than medical records. Further, a recent longitudinal study of adults 70 years of age and older revealed that the older adults who had more negative aging stereotypes at the beginning of the study were more likely to experience hearing decline three years later (Levy, Slade, & Gill, 2006).

Ageism is widespread (Anderson & Harwood, 2009; Tang, 2008). One study found that men were more likely to negatively stereotype older adults than were women (Rupp, Vodanovich, & Crede, 2005). Research indicates that the most frequent form is disrespect for older adults, followed by assumptions about ailments or frailty caused by age (Palmore, 2004). However, the increased number of adults living to an older age has led to active efforts to improve society's image of older adults, obtain better living conditions for older adults, and gain political clout.

Policy Issues in an Aging Society The aging society and older persons' status in this society raise policy issues about the well-being of older adults (Street & D'Amuro, 2009). These include the status of the economy, the provision of health care, supports for families who care for older adults, and generational inequity, each of which we consider in turn.

Status of the Economy An important issue involving the economy and aging is the concern that our economy cannot bear the burden of so many older persons, who by reason of their age alone are usually consumers rather than producers. However, not all persons 65 and over are nonworkers, and not all persons 18 to 64 are workers. And considerably more individuals in the 55-to-64 age group are in the workforce—three out of five men—than a decade ago. Thus, it is incorrect to simply describe older adults as consumers and younger adults as producers. However, the recent economic crisis has placed considerable burdens on many older adults, who have seen their nongovernment retirement funds drop precipitously (Strand, 2010). Especially bothersome is the low rate of savings of U.S. adults, which further exacerbated the financial status of older adults in the recent economic downturn (Gould & Hertel-Fernandez, 2010; Keister & Destro, 2009).

Health Care An aging society also brings with it various problems involving health care (Aldwin, Yancura, & Boeninger, 2011; Bashir & Holroyd, 2010). Escalating health care costs are currently causing considerable concern (Alzheimer's Association, 2010;

ageism Prejudice against others because of their age, especially prejudice against older adults.

What are some concerns about health care for older adults?

Seidler & others, 2010). One factor that contributes to the surge in health costs is the increasing number of older adults. Older adults have more illnesses than younger adults, despite the fact that many older adults report their health as good. Older adults see doctors more often, are hospitalized more often, and have longer hospital stays. Approximately one-third of the total health bill of the United States is for the care of adults 65 and over, who comprise only 12 percent of the population. The health care needs of older adults are reflected in Medicare, the program that provides health care insurance to adults over 65 under the Social Security system (Fu & others, 2010). Of interest is the fact that the United States is the only industrialized nation that provides health insurance specifically for older adults rather than to the population at large, and the only industrialized nation currently without a national health care system. Older adults themselves still pay about one-third of their total health care costs. Thus, older adults as well as younger adults are adversely affected by rising medical costs (Munoz, Munoz, & Wise, 2010; Russell & Rice, 2009).

A special concern is that while many of the health problems of older adults are chronic rather than acute, the medical system is still based on a "cure" rather than a "care" model. Chronic illness is long-term, often lifelong, and requires long-term, if not life-term, management (Garasen, Windspoll, & Johnsen, 2008; Harris, Pan, & Mukhtar, 2010). Chronic illness often follows a pattern of an acute period that may require hospitalization, followed by a longer period of remission, and then repetitions of this pattern. The patient's home, rather than the hospital, often becomes the center of managing the patient's chronic illness. In a home-based system, a new type of cooperative relationship between doctors, nurses, patients, family members, and other service providers needs to be developed (Kamp, Wellman, & Russell, 2010; Vieira, Maltais, & Bourbeau, 2010). Health care personnel need to be trained and be available to provide home services, sharing authority with the patient and perhaps yielding it to them over the long term.

Eldercare **Eldercare** is the physical and emotional caretaking of older members of the family, whether that care is day-to-day physical assistance or responsibility for arranging and overseeing such care. An important issue involving eldercare is how it can best be provided (Beverly & others, 2010; Nabe-Nielsen & others, 2009). With so many women in the labor market, who will replace them as caregivers? An added problem is that many caregivers are in their sixties, and many of them are ill themselves. They may find it especially stressful to be responsible for the care of relatives who are in their eighties or nineties.

Generational Inequity Yet another policy issue involving aging is **generational inequity,** the view that our aging society is being unfair to its younger members because older adults pile up advantages by receiving an inequitably large allocation of resources. Some authors have argued that generational inequity produces intergenerational conflict and divisiveness in the society at large (Longman, 1987). The generational equity issue raises questions about whether the young should be required to pay for the old (Svihula & Estes, 2008).

Income Also of special concern are older adults who are poor (Fisher & others, 2009). Researchers have found that poverty in late adulthood is linked to an increase in physical and mental health problems (Gerst & Mutchler, 2009; Wight & others, 2009). Poverty also is linked to lower levels of physical and cognitive fitness in older adults (Basta & others, 2008). And a recent study revealed that low SES increases the risk of earlier death in older adults (Krueger & Chang, 2008).

Census data suggest that the overall number of older people living in poverty has declined since the 1960s, but in 2008, 9.7 percent of older adults still were living in poverty (U.S. Census Bureau, 2010). In 2008, almost twice as many U.S. women 65 years and older (11.9 percent) lived in poverty than did their male counterparts (6.7 percent) (U.S. Census Bureau, 2010). Nineteen percent of single, divorced, or

eldercare Physical and emotional caretaking for older members of the family, whether by giving day-to-day physical assistance or by being responsible for overseeing such care.

generational inequity The view that our aging society is being unfair to its younger members because older adults pile up advantages by receiving inequitably large allocations of resources.

widowed women 65 years and older lived in poverty. Poverty rates among ethnic minorities are two to three times higher than the rate for non-Latino Whites. Combining gender and ethnicity, 60 percent of older African American women and 50 percent of older Latino women who live alone live in poverty. Also, the oldest-old are the age subgroup of older adults most likely to be living in poverty.

Living Arrangements One stereotype of older adults is that they are often residents in institutions—hospitals, mental hospitals, nursing homes, and so on. However, nearly 95 percent of older adults live in the community. Almost two-thirds of older adults live with family members—spouse, a child, a sibling, for example—and almost one-third live alone. The older people become, the greater are their odds for living alone. Half of older women 75 years and older live alone. The majority of older adults living alone are widowed, with three times as many of these individuals being women than men (U.S. Census Bureau, 2010). Older adults who live alone often report being more lonely than their counterparts who live with someone (Routasalo & others, 2006). However, as with younger adults, living alone as an older adult does not mean being lonely. Older adults who can sustain themselves while living alone often have good health and few disabilities, and they may have regular social exchanges with relatives, friends, and neighbors.

Technology The Internet plays an increasingly important role in access to information and communication in adults as well as youth (Cresci, Yarandi, & Morrell, 2010; Cutler, 2009; Rosenberg & others, 2009). A recent study revealed that older adults are clearly capable of being trained to learn new technologies (Hickman, Rogers, & Fisk, 2007).

How well are older adults keeping up with changes in technology? Older adults are less likely to have a computer in their home and less likely to use the Internet than younger adults, but older adults are the fastest-growing segment of Internet users (Czaja & others, 2006). A 2003 survey indicated that 32 percent of 65 and older U.S. adults (about 11 million) and 61 percent of 50- to 64-year-olds are online (Harris Interactive, 2003). Older adults log more time on the Internet (an average of 8.3 hours per week), visit more Web sites, and spend more money on the Internet than their younger adult counterparts. They are especially interested in learning to use e-mail and going online for health information (Westlake & others, 2007). Increasing numbers of older adults use e-mail to communicate with relatives. As with children and younger adults, cautions about the accuracy of information—in areas such as health care—on the Internet need to always be kept in mind (Cutler, 2009).

Are older adults keeping up with changes in technology?

Review ***Connect*** **Reflect**

LG2 Describe links between personality and mortality, and identify changes in the self and society in late adulthood.

Review

- How are personality traits related to mortality in older adults?
- How does self-esteem change in late adulthood? What characterizes possible selves, self-acceptance, and self-control in older adults?
- How are older adults perceived and treated by society?

Connect

- We learned in this section that poverty is linked to lower levels of physical and cognitive fitness in older adults. What did we learn about poverty and young children in earlier chapters?

Reflect *Your Own Personal Journey of Life*

- What do you envision your life will be like as an older adult?

3 Families and Social Relationships

LG3 Characterize the families and social relationships of aging adults.

- Lifestyle Diversity
- Older Adult Parents and Their Adult Children
- Great-Grandparenting
- Friendship
- Social Support and Social Integration
- Altruism and Volunteerism

Are the close relationships of older adults different from those of younger adults? What are the lifestyles of older adults like? What characterizes the relationships of older adult parents and their adult children? Is the role of great-grandparents different from the role of grandparents? What do friendships and social networks contribute to the lives of older adults? What type of social support do older adults need and want? How might older adults' altruism and volunteerism contribute to positive outcomes?

developmental **connection**

Marriage. The benefits of a happy marriage involve less physical and emotional stress, which puts less wear and tear on the body. Chapter 14, p. 459

LIFESTYLE DIVERSITY

The lifestyles of older adults are changing. Formerly, the later years of life were likely to consist of marriage for men and widowhood for women. With demographic shifts toward marital dissolution characterized by divorce, one-third of adults can now expect to marry, divorce, and remarry during their lifetime. Let's now explore some of the diverse lifestyles of older adults, beginning with those who are married or partnered.

What are some adaptations that many married older adults need to make?

Married Older Adults In 2009, 56 percent of U.S. adults over 65 years of age were married (U.S. Census Bureau, 2010). In 2009, 29 percent of U.S. adults over 65 years of age were widowed (U.S. Census Bureau, 2010). There were more than four times as many widows as widowers.

The time from retirement until death is sometimes referred to as the "final stage in the marriage process." The portrait of marriage in the lives of older adults is a positive one for many couples (Peek, 2009). A recent study revealed that marital satisfaction was greater in older adults than middle-aged adults (Henry & others, 2007). In this study, older adults perceived their spouse to be less hostile than did middle-aged adults.

Retirement alters a couple's lifestyle, requiring adaptation (Higo & Williamson, 2009; Price & Nesteruk, 2010). The greatest changes occur in the traditional family, in which the husband works and the wife is a homemaker. The husband may not know what to do with his time, and his wife may feel uneasy having him around the house so much of the day. In traditional families, both partners may need to move toward more expressive roles. The husband must adjust from being the provider outside of the home to being a helper around the house; the wife must change from being the only homemaker to being a partner who shares and delegates household duties. Marital happiness as an older adult is also affected by each partner's ability to deal with personal conflicts, including aging, illness, and eventual death.

Individuals who are married or partnered in late adulthood are usually happier and live longer than those who are single (Manzoli & others, 2007). Also, a longitudinal study of adults 75 years of age and older revealed that individuals who were married were less likely to die across a span of seven years (Rasulo, Christensen, & Tomassini, 2005).

Divorced and Remarried Older Adults In 2008, 13 percent of women and 10 percent of men 65 years and older were divorced or separated (U.S. Census Bureau, 2009). Many of these individuals were divorced or separated before they entered late adulthood. The majority of divorced older adults are women, due to their greater longevity and because men are more likely to remarry, thus removing themselves from the pool of divorced older adults (Peek, 2009). Divorce is far less common in older adults than younger adults likely reflecting cohort effects rather than age effects since divorce was somewhat rare when current cohorts of older adults were young (Peek, 2009).

There are social, financial, and physical consequences of divorce for older adults (Mitchell, 2007). Divorce can weaken kinship ties when it occurs in later life, especially in the case of older men (Cooney, 1994). Divorced older women are less likely to have adequate financial resources than married older women, and as earlier in adulthood, divorce is linked to more health problems in older adults (Lillard & Waite, 1995).

Rising divorce rates, increased longevity, and better health have led to an increase in remarriage by older adults (Ganong & Coleman, 2006). What happens when an older adult wants to remarry or does remarry? Researchers have found that some older adults perceive negative social pressure about their decision to remarry (McKain, 1972). These negative sanctions range from raised eyebrows to rejection by adult children (Ganong & Coleman, 2006). However, the majority of adult children support the decision of their older adult parents to remarry. Researchers have found that remarried parents and stepparents provide less support to adult stepchildren than parents in first marriages (White, 1994).

Cohabiting Older Adults An increasing number of older adults cohabit (Mutchler, 2009). In 1960, hardly any older adults cohabited (Chevan, 1996). Today, approximately 3 percent of older adults cohabit (U.S. Census Bureau, 2004). It is expected that the number of cohabiting older adults will increase even further when baby boomers begin to turn 65 in 2010 and bring their historically more nontraditional values about love, sex, and relationships to late adulthood. In many cases, the cohabiting is more for companionship than for love. In other cases, for example, when one partner faces the potential for expensive care, a couple may decide to maintain their assets separately and thus not marry. One study found that older adults who cohabited had a more positive, stable relationship than younger adults who cohabited, although cohabiting older adults were less likely to have plans to marry their partner (King & Scott, 2005).

Does cohabiting affect an individual's health? One recent study of more than 8,000 51- to 61-year-old adults revealed that the health of couples who cohabited did not differ from the health of married couples (Waite, 2005). However, another recent study of individuals 50 years of age and older found that those who cohabited were more depressed than their married counterparts (Brown, Bulanda, & Lee, 2005).

developmental **connection**

Sexuality. Middle-aged men want sex more, think about it more, and masturbate more than middle-aged women. Chapter 15, p. 486

Romance and Sex in Older Adults' Relationships Few of us imagine older couples taking an interest in sex or romantic relationships. We might think of them as being interested in a game of bridge or a conversation on the porch, but not much else. In fact, a number of older adults date. The increased health and longevity of older adults have resulted in a much larger pool of active older adults. And the increased divorce rate has added more older adults to the adult dating pool.

Regarding their sexuality, older adults may express their sexuality differently than younger adults, especially when engaging in sexual intercourse becomes difficult. Older adults especially enjoy touching and caressing as part of their sexual relationship. When older adults are healthy, they still may engage in sexual activities (Waite, Das, & Laumann, 2009; Waite & others, 2009). For example, a recent U.S. study found that among 75 to 85 year olds, 40 percent of women and 78 percent of men reported having a stable sexual partner (Waite & others, 2009). The gender differential is likely due to women's higher likelihood of being widowed, age difference in spouses, and a consequence of their probability

What are some ways that older adults retain their sexuality?

of living longer. With the increased use of drugs to treat erectile dysfunction, older adults can be expected to increase their sexual activity (Aubin & others, 2009; Chevret-Measson & others, 2009). However, companionship often becomes more important than sexual activity in older adults. Older couples often emphasize intimacy over sexual prowess.

OLDER ADULT PARENTS AND THEIR ADULT CHILDREN

Parent-child relationships in later life differ from those earlier in the life span (Fingerman, Whiteman, & Dotterer, 2009; Fingerman, Miller, & Seidel, 2009; Merrill, 2009). They are influenced by a lengthy joint history and extensive shared experiences and memories.

Approximately 80 percent of older adults have living children, many of whom are middle-aged. About 10 percent of older adults have children who are 65 years or older. Adult children are an important part of the aging parent's social network. Researchers have found that older adults with children have more contacts with relatives than those without children (Johnson & Troll, 1992).

Increasingly, diversity characterizes older adult parents and their adult children. Divorce, remarriage, cohabitation, and nonmarital childbearing are more common in the history of older adults today than in the past (Merrill, 2009).

Gender plays an important role in relationships involving older adult parents and their children (Ward-Griffin & others, 2007). Adult daughters rather than adult sons are more likely to be involved in the lives of aging parents. For example, adult daughters are three times more likely than are adult sons to give parents assistance with daily living activities (Dwyer & Coward, 1991).

A valuable service that adult children can perform is to coordinate and monitor services for an aging parent who becomes disabled (Silverstein, 2009). This might involve locating a nursing home and monitoring its quality, procuring medical services, arranging public service assistance, and handling finances. In some cases, adult children provide direct assistance with daily living, including such activities as eating, bathing, and dressing. Even less severely impaired older adults may need help with shopping, housework, transportation, home maintenance, and bill paying.

A recent study revealed that even when aging parents had health problems, they and their children generally described positive changes in their relationship in recent years (Fingerman & others, 2007). However, in most cases researchers have found that relationships between aging parents and their children are usually characterized by ambivalence. Perceptions include love, reciprocal help, and shared values on the positive side and isolation, family conflicts and problems, abuse, neglect, and caregiver stress on the negative side (Fowler, 1999). A study of 1,599 adult children's relationships with their older adult parents revealed that ambivalence was likely to be present when relationships involved in-laws, those in poor health, and adult children with poor parental relationships in early life (Wilson, Shuey, & Elder, 2003).

At the beginning of the 20th century, the three-generation family was common, but now the four-generation family is common as well. Thus, an increasing number of grandparents are also great-grandparents. The four-generation family shown here is the Jordans—author John Santrock's mother-in-law, daughter, granddaughter, and wife.

GREAT-GRANDPARENTING

Because of increased longevity, more grandparents today than in the past are also great-grandparents. At the turn of the 20th century, the three-generation family was common, but now the four-generation family is common. One contribution of great-grandparents is to transmit family history by telling their children, grandchildren, and great-grandchildren where the family came from, what their members achieved, what they endured, and how their lives changed over the years (Harris, 2002).

There has been little research on great-grandparenting. One study examined the relationship between young adults and their grandparents and great-grandparents (Roberto & Skoglund, 1996). The young adults interacted with, and participated in more activities with, their grandparents than great-grandparents. They also perceived

convoy model of social relations Model in which individuals go through life embedded in a personal network of individuals to whom they give and from whom they receive support.

their grandparents to have a more defined role and as more influential in their lives than great-grandparents.

Lillian Troll (2000) has found that older adults who are embedded in family relationships have much less distress than those who are family deprived. Next, we will consider these other aspects of social relationships in late adulthood: friendship, social support, and social integration.

FRIENDSHIP

In early adulthood, friendship networks expand as new social connections are made away from home. In late adulthood, new friendships are less likely to be forged, although some adults do seek out new friendships, especially following the death of a spouse (Zettel-Watson & Rook, 2009).

Aging expert Laura Carstensen (1998) concluded that people choose close friends over new friends as they grow older. And as long as they have several close people in their network, they seem content, says Carstensen. Supporting Carstensen's view, recall the recent study we described earlier in this chapter that compared with younger adults, older adults said they experienced less intense positive emotions with new friends and more intense positive emotions with established friends (Charles & Piazza, 2007) (see Figure 19.6).

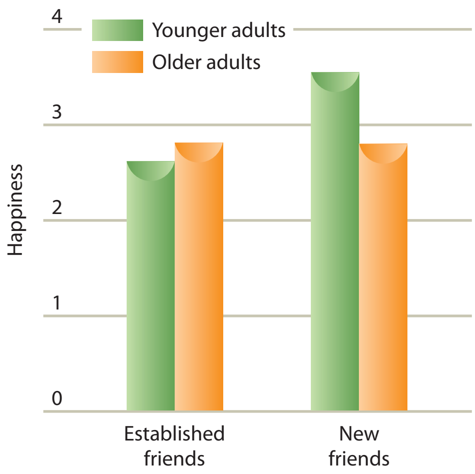

FIGURE **19.6**

HAPPINESS OF YOUNGER ADULTS AND OLDER ADULTS WITH NEW AND ESTABLISHED FRIENDS. *Note:* The happiness scale ranged from 0 to 6 with participants rating how intensely they experienced happiness (0 = not at all, 6 = extremely intense). Older adults mean age 71; younger adults mean age 23.

In one study of 128 married older adults, women were more depressed than men if they did not have a best friend, and women who did have a friend reported lower levels of depression (Antonucci, Lansford, & Akiyama, 2001). Similarly, women who did not have a best friend were less satisfied with life than women who did have a best friend.

Three recent studies documented the importance of friendship in older adults:

- A study of almost 1,700 U.S. adults 60 years and older revealed that friendships were more important than family relationships in predicting mental health (Fiori, Antonucci, & Cortina, 2006). Even when the researchers controlled for health, age, income, and other factors, older adults whose social contacts were mainly restricted to their family members were more likely to have depressive symptoms. Friends likely provide emotional intimacy and companionship, as well as integration into the community (Antonucci, Akiyama, & Sherman, 2007).
- A recent longitudinal study of adults 75 years of age and older revealed that individuals with close ties with friends were less likely to die across a seven-year age span (Rasulo, Christensen, & Tomassini, 2005). The findings were stronger for women than men.
- A recent study revealed that unmarried older adults embedded in a friend-focused network fared better physically and psychologically than unmarried older adults in a restricted network with little friend contact (Fiori, Smith, & Antonucci, 2007).

developmental **connection**

Family and Peers. It takes time to develop intimate friendships, so friendships that have endured over the adult years are often deeper than those that have just been formed in middle adulthood. Chapter 16, p. 518

What are some characteristics of older adults' friendships?

SOCIAL SUPPORT AND SOCIAL INTEGRATION

Social support and social integration play important roles in the physical and mental health of older adults (Antonucci & others, 2011; Birditt, 2009; Kahana, Kahana, & Hammel, 2009).

Social Support In the **convoy model of social relations,** individuals go through life embedded in a personal network of individuals to whom they give and from whom they receive social support (Antonucci, Birditt, & Kalinauskas, 2009; Antonucci & others, 2011). Social support can help

What role does social support play in the health of older adults?

individuals of all ages cope more effectively (Griffiths & others, 2007). For older adults, social support is related to their physical and mental health (Cheng, Lee, & Chow, 2010). It is linked with a reduction in symptoms of disease, with the ability to meet one's own health care needs, and mortality (Rook & others, 2007). Social support also decreases the probability that an older adult will be institutionalized and is associated with a lower incidence of depression (Cacioppo & others, 2006).

Social support for older adults can be provided by different adults (Antonucci, Birditt, & Akiyama, 2009; Antonucci & others, 2011). Older adults who are married are less likely to need formal social supports, such as home nursing care, adult day care, and home-delivered meals, than nonmarried older adults. Families play important roles in social support for older adults, but friends also can provide invaluable resources for social support. Also, social support for older adults may vary across cultures. For example, in the United States, the focal support person for an older adult is most likely to be a daughter, whereas in Japan it is most likely to be a daughter-in-law.

Social Integration Social integration also plays an important role in the lives of many older adults (Rohr & Lang, 2009; von Tilburg, 2009). Remember from our earlier discussion of socioemotional selectivity theory that many older adults choose to have fewer peripheral social contacts and more emotionally positive contacts with friends and family (Charles & Carstensen, 2009, 2010). Thus, a decrease in the overall social activity of many older adults may reflect their greater interest in spending more time in the small circle of friends and families where they are less likely to have negative emotional experiences. Researchers have found that older adults tend to report being less lonely than younger adults and less lonely than would be expected based on their circumstances (Schnittker, 2007). Their reports of feeling less lonely than younger adults likely reflect their more selective social networks and greater acceptance of loneliness in their lives (Koropeckyj-Cox, 2009).

A recent study explored the quality of marriages in older adults and its link to loneliness (de Jong Gierveld & others, 2009). Two types of loneliness were studied: *emotional* (the affective state of feeling isolated) and *social* (a factor of integration in social networks that can provide a sense of connection with others). Approximately 20 to 25 percent of the older adults who were married felt moderate or strong emotional or social loneliness. Stronger emotional and social loneliness appeared in older adults whose spouse has health problems, who don't usually get emotional support from their spouse, who rarely converse with their spouse, who rate their sex life as not very pleasant or not applicable. Emotional loneliness was stronger in older adults in their second marriage and social loneliness was stronger in husbands with a disabled wife. Also, stronger emotional and social loneliness characterized older adults who had smaller social networks and less contact with their children.

Researchers have found that a low level of social integration is linked with coronary heart disease in older adults (Loucks & others, 2006). Also, in one study, being part of a social network was related to longevity, especially for men (House, Landis, & Umberson, 1988). Being lonely and socially isolated is a significant health risk factor in older adults (Koropeckyj-Cox, 2009). For example, a recent study found that loneliness predicted increased blood pressure four years later in middle-aged and older adults (Hawkley & others, 2010).

ALTRUISM AND VOLUNTEERISM

A common perception is that older adults need to be given help rather than give help themselves. However, a 12-year longitudinal study revealed that older adults who had persistently low or declining feelings of usefulness to others had an increased risk of earlier death (Gruenewald & others, 2009). Further, researchers recently have found that when older adults engage in altruistic behavior and volunteering they benefit from these activities. For example, a recent study revealed that volunteering was linked with less frailty in older adults (Jung & others, 2010). Volunteering peaks in middle adulthood and then shows a slight downturn in late adulthood (Corporation for National and Community Service, 2006). However, older adults are more likely than any other age group to volunteer more than 100 hours annually (Burr, 2009). Almost 50 percent of the volunteering efforts of older adults are for services provided by religious organizations (Burr, 2009).

One study followed 423 older adult couples for five years (Brown & others, 2003). At the beginning of the study, the couples were asked about the extent to which they had given or received emotional or practical help in the past year. Five years later, those who said they had helped others were half as likely to have died. One possible reason for this finding is that helping others may reduce the output of stress hormones, which improves cardiovascular health and strengthens the immune system.

A recent study of 21,000 individuals 50 to 79 years of age in 21 countries revealed that one-third give back to society, saying that they volunteer now or have volunteered in the past (HSBC Insurance, 2007). In this study, about 50 percent who volunteer reported that they do so for at least one-half day each week. And a recent study found that volunteering steadily increased from 57 to 85 years of age (Cornwell, Laumann, & Schumm, 2008). An eight-year longitudinal study indicated that older adults who were intense about their volunteering, volunteered for a number of years, and were married to volunteers were the least likely to quit volunteering (Butrica, Johnson, & Zedlewsi, 2009). Older adults who were nonvolunteers were more likely to begin volunteering if they had not volunteered for several years and their spouses were volunteers.

Researchers also have found that volunteering as an older adult is associated with a number of positive outcomes (Burr, 2009). A recent study of 401 older adults in 13 volunteer programs revealed that more than 30 percent said they were a great deal better off because of volunteering and almost 60 percent reported that their family benefited (Morrow-Howell, Hong, & Tang, 2009). A study of 2,000 older adults in Japan revealed that those who gave more assistance to others had better physical health than their elderly counterparts who gave less assistance (Krause & others, 1999). Among the reasons for the positive outcomes of volunteering are its provision of constructive activities and productive roles, social integration, and enhanced meaningfulness (Tan & others, 2007).

Ninety-eight-year-old volunteer Iva Broadus plays cards with 10-year-old DeAngela Williams in Dallas, Texas. Iva recently was recognized as the oldest volunteer in the Big Sister program in the United States. Iva says that card-playing helps to keep her memory and thinking skills sharp and can help DeAngela's as well.

developmental **connection**

Community and Culture. Service learning is linked with numerous positive outcomes in youth. Chapter 11, p. 376

Review *Connect* Reflect

LG3 Characterize the families and social relationships of aging adults.

Review

- How would you profile the diversity of adult lifestyles?
- What characterizes the relationships of older adult parents and their adult children?
- Is the role of great-grandparents different than for grandparents?
- What is the friendship of older adults like?
- What roles do social support and social integration play in late adulthood?
- How are altruism and volunteerism linked to positive outcomes in older adults?

Connect

- In this section, you read that a low level of social integration is linked with coronary heart disease in older adults. What did you learn about heart disease and stress in middle adulthood in Chapter 15?

Reflect *Your Own Personal Journey of Life*

- If you are an emerging or young adult, what is the nature of the relationship of your parents with their parents and grandparents (if they are alive)? If you are a middle-aged adult, how would you characterize your relationship with your parents (if they are still alive)?

4 Ethnicity, Gender, and Culture

LG4 Summarize how ethnicity, gender, and culture are linked with aging.

Ethnicity

Gender

Culture

How is ethnicity linked to aging? Do gender roles change in late adulthood? What are the social aspects of aging in different cultures?

ETHNICITY

Of special concern are ethnic minority older adults, especially African Americans and Latinos, who are overrepresented in poverty statistics (Kingson & Bartholomew, 2009). Consider Harry, a 72-year-old African American who lives in a run-down hotel in Los Angeles. He suffers from arthritis and uses a walker. He has not been able to work for years, and government payments are barely enough to meet his needs.

Comparative information about African Americans, Latinos, and Whites indicates a possible double jeopardy for elderly ethnic minority individuals. They face problems related to *both* ageism and racism (Ciol & others, 2008). One study of more than 4,000 older adults found that African Americans perceived more discrimination than non-Latino Whites (Barnes & others, 2004). Both the wealth and the health of ethnic minority older adults decrease more rapidly than for elderly non-Latino Whites (Yee & Chiriboga, 2007). Older ethnic minority individuals are more likely to become ill but less likely to receive treatment (Hinrichsen, 2006). They also are more likely to have a history of less education, unemployment, worse housing conditions, and shorter life expectancies than their non-Latino White counterparts (Himes, Hogan, & Eggebeen, 1996). And many ethnic minority workers never enjoy the Social Security and Medicare benefits to which their earnings contribute, because they die before reaching the age of eligibility for benefits.

What are some ways that older minority-group individuals cope with living?

Despite the stress and discrimination older ethnic minority individuals face, many of these older adults have developed coping mechanisms that allow them to survive in the dominant non-Latino White world. Extension of family networks helps older minority-group individuals cope with the bare essentials of living and gives them a sense of being loved (Karasik & Hamon, 2007). Churches in African American and Latino communities provide avenues for meaningful social participation, feelings of power, and a sense of internal satisfaction (Hill & others, 2006). And residential concentrations of ethnic minority groups give their older members a sense of belonging. Thus, it always is important to consider individual variations in the lives of aging minorities (Albert, 2007). To read about one individual who is providing help for aging minorities, see *Connecting With Careers*.

GENDER

Do our gender roles change when we become older adults? Some developmentalists conclude that femininity decreases in women and that masculinity decreases in men when they reach the late adulthood years (Gutmann, 1975). The evidence suggests that older men do become more feminine—nurturant, sensitive, and so on—but it appears that older women do not necessarily become more masculine—assertive, dominant, and so on (Turner, 1982). Keep in mind that cohort effects are especially important to consider in areas such as gender roles. As sociohistorical changes take place and are assessed more frequently in life-span investigations, what were once perceived to be age effects may turn out to be cohort effects (Schaie, 2007).

A special concern is the stress faced by older African American women, many of whom view religion as a source of strength to help them cope. *What are some other characteristics of being female, ethnic, and old?*

A possible double jeopardy also faces many women—the burden of *both* ageism and sexism (Calisanti, 2009). Not only is it important to be concerned about older

connecting with careers

Norma Thomas, Social Work Professor and Administrator

Dr. Norma Thomas has worked for more than three decades in the field of aging. She obtained her undergraduate degree in social work from Pennsylvania State University and her doctoral degree in social work from the University of Pennsylvania. Thomas' activities are varied. Earlier in her career, as a social work practitioner, she provided services to older adults of color in an effort to improve their lives. She currently is a professor and academic administrator at Widener University in Chester, Pennsylvania, a fellow of the Institute of Aging at the University of Pennsylvania, and the chief executive officer and cofounder of the Center on Ethnic and Minority Aging (CEMA). CEMA was formed to provide research, consultation, training, and services to benefit aging individuals of color, their families, and their communities. Thomas has created numerous community service events that benefit older adults of color, especially African Americans and Latinos. She has also been a consultant to various national, regional, and state agencies in her effort to improve the lives of aging adults of color.

For more information about what professors and social workers do, see pages 47 and 48 in the Careers in Life-Span Development appendix.

Norma Thomas.

women's double jeopardy of ageism and sexism, but special attention also needs to be devoted to female ethnic minority older adults (Leifheit-Limson & Levy, 2009). They face what could be described as triple jeopardy—ageism, sexism, and racism. Older women in ethnic minority groups have faced considerable stress in their lives. In the face of this stress, they have shown remarkable adaptiveness, resilience, responsibility, and coping skills.

CULTURE

What promotes a good old age in most cultures? A recent analysis indicated that these three factors are important in living the "good life" as an older adult: health, security, and kinship/support (Fry, 2007).

Another important question is: What factors are associated with whether older adults are accorded a position of high status in a culture? In one view, seven factors are most likely to predict high status for older adults in a culture (Sangree, 1989):

- Older persons have valuable knowledge.
- Older persons control key family/community resources.
- Older persons are permitted to engage in useful and valued functions as long as possible.
- There is role continuity throughout the life span.
- Age-related role changes involve greater responsibility, authority, and advisory capacity.
- The extended family is a common family arrangement in the culture, and the older person is integrated into the extended family.
- In general, respect for older adults is greater in collectivistic cultures (such as China and Japan) than in individualistic cultures (such as

Cultures vary in the prestige they give to older adults. In the Navajo culture, older adults are especially treated with respect because of their wisdom and extensive life experiences. *What are some other factors that are linked with respect for older adults in a culture?*

the United States). However, some researchers are finding that this collectivistic/individualistic difference in respect for older adults is not as strong as it used to be, and that in some cases older adults in individualistic cultures receive considerable respect (Antonucci, Vandewater, & Lansford, 2000).

Review *Connect* Reflect

LG4 Summarize how ethnicity, gender, and culture are linked with aging.

Review

- How does ethnicity modify the experience of aging?
- Do gender roles change in late adulthood? Explain.
- How is aging experienced in different cultures?

Connect

- In this section, you read that ethnic minorities face many particular challenges in aging. What did you learn about ethnicity and life expectancy in Chapter 17?

Reflect *Your Own Personal Journey of Life*

- How would you describe the nature of the experiences of the older adults in your family background that were influenced by their ethnicity, gender, and culture?

5 Successful Aging

LG5 Explain how to age successfully.

developmental **connection**

Health. Regular exercise is linked to increased longevity and prevention of many chronic diseases. Chapter 17, p. 551

For too long, the positive dimensions of late adulthood were ignored (Charles & Carstensen 2010; Depp & Jeste, 2010; Stirling, 2011). Throughout this book, we have called attention to the positive aspects of aging. There are many robust, healthy older adults (Willcox & others, 2008). With a proper diet, an active lifestyle, mental stimulation and flexibility, positive coping skills, good social relationships and support, and the absence of disease, many abilities can be maintained or in some cases even improved as we get older (Antonucci & others, 2011; Hughes, 2010; Lachman & others, 2010). Even when individuals develop a disease, improvements in medicine mean that increasing numbers of older adults can still lead active, constructive lives.

Buzz Aldrin, eighty-year-old former astronaut, and Ashley Costa competing on a recent Dancing with the Stars TV show. Being active reflects successful aging.

Being active is especially important to successful aging (Erickson & Kramer, 2009). Older adults who exercise regularly, get out and go to meetings, participate in church activities, and go on trips are more satisfied with their lives than their counterparts who disengage from society (Levin, Chatters, & Taylor, 2010; Venturelli & others, 2010). Older adults who are emotionally selective, optimize their choices, and compensate effectively for losses increase their chances of aging successfully (Baltes & Smith, 2008; Schiebe & Carstensen, 2010; Staudinger & Jacobs, 2011).

Successful aging also involves perceived control over the environment (Bandura, 2010a; HSBC Insurance, 2007). In Chapter 17, we described how perceived control over the environment had a positive effect on nursing home residents' health and longevity. In recent years, the term *self-efficacy* has often been used to describe perceived control over the environment and the ability to produce positive outcomes (Bandura, 2009, 2010a). Researchers have found that many older adults are quite effective in maintaining a sense of control and have a positive view of themselves (Dunbar, Leventhal, & Leventhal, 2007). For example, a study of centenarians found that many were very happy and that self-efficacy and an optimistic attitude were linked to their happiness (Jopp & Rott, 2006). Examining the positive aspects of aging is an important trend in life-span development and is likely to benefit future generations of older adults (Antonucci & others, 2011; Carstensen & Charles, 2010; Stirling, 2011).

Review *Connect* Reflect

LG5 Explain how to age successfully.

Review

- What factors are linked with aging successfully?

Connect

- In this section, you read that self-efficacy and an optimistic attitude are linked to the happiness of centenarians. In Chapter 17, what factors did you learn play an important role in surviving to an extreme old age?

Reflect *Your Own Personal Journey of Life*

- How might your ability to age successfully as an older adult be related to what you are doing in your life now?

topical **connections**

In death, dying, and grieving, dying individuals and those close to them experience intense emotions. The dying individual doesn't go through a set sequence of stages, but at various points may show denial, anger, or acceptance. It is important for family and friends to communicate effectively with a dying person. In coping with the death of someone, grief may be experienced as emotional numbness, separation anxiety, despair, sadness, or loneliness. In some cases, grief may last for years. Among the most difficult losses to death are when a child dies or when a spouse dies. Social support benefits widows and widowers.

looking ***forward***

reach your **learning goals**

Socioemotional Development in Late Adulthood

1 Theories of Socioemotional Development

LG1 Discuss four theories of socioemotional development and aging.

Erikson's Theory

- Erikson's eighth and final stage of development, which individuals experience in late adulthood, involves reflecting on the past and either integrating it positively or concluding that one's life has not been well spent. Life review is an important theme in Erikson's stage of integrity versus despair.

Activity Theory

- Activity theory states that the more active and involved older adults are, the more likely they are to be satisfied with their lives. This theory has been strongly supported.

Socioemotional Selectivity Theory

- Socioemotional selectivity theory states that older adults become more selective about their social networks. Because they place a high value on emotional satisfaction, they are motivated to spend more time with familiar individuals with whom they have had rewarding relationships. Knowledge-related and emotion-related goals change across the life span, with emotion-related goals being more important when individuals get older.

Selective Optimization With Compensation Theory

- Selective optimization with compensation theory states that successful aging is linked with three main factors: (1) selection, (2) optimization, and (3) compensation. These are especially likely to be relevant when loss occurs.

2 Personality, the Self, and Society

LG2 Describe links between personality and mortality, and identify changes in the self and society in late adulthood.

Personality

- The personality traits of conscientiousness and agreeableness increase in late adulthood. Lower levels of conscientiousness, extraversion, and openness to experience, a higher level of neuroticism, negative affect, pessimism, and a negative outlook on life are related to earlier death in late adulthood.

The Self and Society

- In one large-scale study, self-esteem increased through most of adulthood but declined in the seventies and eighties. Further research is needed to verify these developmental changes in self-esteem. The stability of self-esteem declines in older adults. Possible selves are what individuals might become, what they would like to become, and what they are afraid of becoming. Possible selves change during late adulthood and are linked to engagement in various activities and longevity. Changes in types of self-acceptance occur through the adult years as acceptance of ideal and future selves decreases with age and acceptance of past selves increases. Most older adults effectively maintain a sense of self-control, although self-regulation may vary by domain. For example, older adults often show less self-regulation in the physical domain than younger adults.

Older Adults in Society

- Ageism is prejudice against others because of their age. Too many negative stereotypes of older adults continue to exist. Social policy issues in an aging society include the status of the economy and the viability of the Social Security system, the provision of health care, eldercare, and generational inequity. Of special concern are older adults who are in poverty. Poverty rates are especially high among older women who live alone and ethnic minority older adults. Most older adults live in the community, not in institutions. Almost two-thirds of older adults live with family members. Older adults are less likely to have a computer in their home and less likely to use the Internet than younger adults, but they are the fastest-growing age segment of Internet users.

3 Families and Social Relationships

LG3 Characterize the families and social relationships of aging adults.

Lifestyle Diversity

- Older adult men are more likely to be married than older adult women. Retirement alters a couple's lifestyle and requires adaptation. Married older adults are often happier than single older adults. There are social, financial, and physical consequences of divorce for older adults. More divorced older adults, increased longevity, and better health have led to an increase in remarriage by older adults. Some older adults perceive negative pressure about their decision to remarry, although the majority of adult children support the decision of their older adult parents to remarry. An increasing number of older adults cohabit. Older adults especially enjoy touching and caressing as part of their sexual relationship.

Older Adult Parents and Their Adult Children

- Approximately 80 percent of older adults have living children, many of whom are middle-aged. Increasingly, diversity characterizes older parents and their adult children. Adult daughters are more likely than adult sons to be involved in the lives of aging parents. An important task that adult children can perform is to coordinate and monitor services for an aging parent who becomes disabled. Ambivalence can characterize the relationships of adult children with their aging parents.

Great-Grandparenting

- Because of increased longevity, more grandparents today are also great-grandparents. One contribution of great-grandparents is family history. One research study found that young adults have a more involved relationship with grandparents than great-grandparents.

Friendship

- There is more continuity than change in friendship for older adults.

Social Support and Social Integration

- Social support is linked with improved physical and mental health in older adults. Older adults who participate in more organizations live longer than their counterparts who have low participation rates. Older adults often have fewer peripheral social ties but a strong motivation to spend time in relationships with close friends and family members that are rewarding.

Altruism and Volunteerism

- Altruism is linked to having a longer life. Volunteering is associated with higher life satisfaction, less depression and anxiety, better physical health, and more positive effect and less negative effect.

4 Ethnicity, Gender, and Culture

LG4 Summarize how ethnicity, gender, and culture are linked with aging.

Ethnicity

- Aging minorities face special burdens, having to cope with the double burden of ageism and racism. Nonetheless, there is considerable variation in aging minorities.

Gender

- There is stronger evidence that men become more feminine (nurturant, sensitive) as older adults than there is that women become more masculine (assertive). Older women face a double jeopardy of ageism and sexism.

Culture

- Historically, respect for older adults in China and Japan was high, but today their status is more variable. Factors that predict high status for the elderly across cultures range from their valuable knowledge to integration into the extended family.

5 Successful Aging

LG5 Explain how to age successfully.

- Increasingly, the positive aspects of older adults are being studied. Factors that are linked with successful aging include an active lifestyle, positive coping skills, good social relationships and support, and the absence of disease.

key terms

integrity versus despair 594
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section **ten**

Years following years steal something every day;
At last they steal us from ourselves away.

—ALEXANDER POPE
English Poet, 18th Century

Endings

Our life ultimately ends—when we approach life's grave sustained and soothed with unfaltering trust or rave at the close of day; when at last years steal us from ourselves; and when we are linked to our children's children's children by an invisible cable that runs from age to age. This final section contains one chapter: "Death, Dying, and Grieving" (Chapter 20).

chapter 20

DEATH, DYING, AND GRIEVING

chapter outline

1 The Death System and Cultural Contexts

Learning Goal 1 Describe the death system and its cultural and historical contexts.

The Death System and Its Cultural Variations
Changing Historical Circumstances

2 Defining Death and Life/Death Issues

Learning Goal 2 Evaluate issues in determining death and decisions regarding death.

Issues in Determining Death
Decisions Regarding Life, Death, and Health Care

3 A Developmental Perspective on Death

Learning Goal 3 Discuss death and attitudes about it at different points in development.

Causes of Death
Attitudes Toward Death at Different Points in the Life Span

4 Facing One's Own Death

Learning Goal 4 Explain the psychological aspects involved in facing one's own death and the contexts in which people die.

Kübler-Ross' Stages of Dying
Perceived Control and Denial
The Contexts in Which People Die

5 Coping With the Death of Someone Else

Learning Goal 5 Identify ways to cope with the death of another person.

Communicating With a Dying Person
Grieving
Making Sense of the World
Losing a Life Partner
Forms of Mourning

Paige Farley-Hackel and her best friend Ruth McCourt teamed up to take McCourt's 4-year-old daughter, Juliana, to Disneyland. They were originally booked on the same flight from Boston to Los Angeles, but McCourt decided to use her frequent flyer miles and go on a different airplane. Both their flights exploded 17 minutes apart after terrorists hijacked them, then rammed them into the twin towers of the World Trade Center in New York City on 9/11/2001.

Forty-five-year-old Ruth McCourt was a homemaker from New London, Connecticut, who met Farley-Hackel at a day spa she used to own in Boston. McCourt gave up the business when she married, but the friendship between the two women lasted. They often traveled together and shared their passion for reading, cooking, and learning.

Forty-six-year-old Farley-Hackel was a writer, motivational speaker, and spiritual counselor who lived in Newton, Massachusetts. She was looking forward to the airing of the first few episodes of her new radio program, "Spiritually Speaking," and wanted to eventually be on *The Oprah Winfrey Show*, said her husband, Allan Hackel. Following 9/11, Oprah included a memorial tribute to Farley-Hackel, McCourt, and Juliana.

topical **connections**

The leading cause in the U.S. of death in infancy is sudden infant death syndrome (SIDS). In early childhood, motor vehicle accidents are the leading cause of death, followed by cancer and cardiovascular disease. Injuries are the leading cause of death during middle and late childhood, and the most common cause of severe injury and death in this period is motor vehicle accidents, either as a pedestrian or as a passenger. The three leading causes of death in adolescence are accidents, homicide, and suicide. Emerging adults have more than twice the mortality rate of adolescents. For many years, heart disease was the leading cause of death in middle adulthood, followed by cancer; however, in 2005 more individuals 45 to 64 years of age in the United States died of cancer, followed by cardiovascular disease. Men have higher mortality rates than women for all of the leading causes of death. Nearly 60 percent of 65- to 74-year-old U.S. adults die of cancer or cardiovascular disease, with cancer now being the leading cause of death. However, in the age groups of 75 to 84 and 85 and over, cardiovascular disease is the leading cause of death.

← *looking* ***back***

preview

In this final chapter of the book, we will explore many aspects of death and dying. Among the questions that we will ask are: What characterizes the death system and its cultural and historical contexts? How can death be defined? What are some links between development and death? How do people face their own death? How do individuals cope with the death of someone they love?

1 The Death System and Cultural Contexts

LG1 Describe the death system and its cultural and historical contexts.

The Death System and Its Cultural Variations

Changing Historical Circumstances

Today in the United States, deaths of older adults account for approximately two-thirds of the 2 million deaths that occur each year. Thus, what we know about death, dying, and grieving mainly is based on information about older adults. Youthful death is far less common. What has changed historically in the United States is when, where, and how people die. And how we deal with death is part of our culture. Every culture has a death system, and variations in this death system occur across cultures.

THE DEATH SYSTEM AND ITS CULTURAL VARIATIONS

Robert Kastenbaum (2009) emphasizes that a number of components comprise the *death system* in any culture. The components include:

- *People.* Because death in inevitable, everyone is involved with death at some point, either their own death or the death of others. Some individuals have a more systematic role with death, such as those who work in the funeral industry and the clergy, as well as people who work in life-threatening contexts such as firemen and policemen.
- *Places or contexts.* These include hospitals, funeral homes, cemeteries, hospices, battlefields, and memorials (such as the Vietnam Veterans Memorial wall in Washington, DC).
- *Times.* Death involves times or occasions, such as Memorial Day in the United States, and the Day of the Dead in Mexico, which are times to honor those who have died. Also, anniversaries of disasters such as D-Day in World War II, 9/11/2001, and Hurricane Katrina in 2005, as well as the 2004 tsunami in Southeast Asia that took approximately 100,000 lives, are times when those who died are remembered in special ways such as ceremonies.
- *Objects.* Many objects in a culture are associated with death, including caskets, various black objects such as clothes, arm bands, and hearses.
- *Symbols.* Symbols such as a skull and crossbones, as well as last rites in the Catholic religion and various religious ceremonies, are connected to death.

What are some cultural variations in the death system? To live a full life and die with glory was the prevailing goal of the ancient Greeks. Individuals are more conscious of death in times of war, famine, and plague. Whereas Americans are conditioned from early in life to live as though they were immortal, in much of the world this fiction cannot be maintained. Death crowds the streets of Calcutta in daily overdisplay, as

These children's parents died when they were swept away by the tsunami in Indonesia in 2004. The death system includes times such as the 2004 tsunami. *What are some other components of the death system?*

it does in the impoverished villages of Africa's Sahel. By contrast, in the United States it is not uncommon to reach adulthood without having seen someone die.

Most societies throughout history have had philosophical or religious beliefs about death, and most societies have a ritual that deals with death (Bruce, 2007). Death may be seen as a punishment for one's sins, an act of atonement, or a judgment of a just God. For some, death means loneliness; for others, death is a quest for happiness. For still others, death represents redemption, a relief from the trials and tribulations of the earthly world. Some embrace death and welcome it; others abhor and fear it. For those who welcome it, death may be seen as the fitting end to a fulfilled life. From this perspective, how we depart from Earth is influenced by how we have lived.

In most societies, death is not viewed as the end of existence—though the biological body has died, the spiritual body is believed to live on. This religious perspective is favored by most Americans as well (Gowan, 2003). Cultural variations in attitudes toward death include belief in reincarnation, which is an important aspect of the Hindu and Buddhist religions (Dillon, 2003). In the Gond culture of India, death is believed to be caused by magic and demons. The members of the Gond culture react angrily to death. In the Tanala culture of Madagascar, death is believed to be caused by natural forces. The members of the Tanala culture show a much more peaceful reaction to death than members of the Gond culture. Figure 20.1 shows a ritual associated with death in South Korea.

In many ways, we in the United States are death avoiders and death deniers (Norouzieh, 2005). This denial can take many forms, including the tendency of the funeral industry to gloss over death and fashion lifelike qualities in the dead and the persistent search for a fountain of youth.

A family of Hurricane Katrina victims walk past a covered body in front of the convention center in New Orleans in 2005.

developmental **connection**

Life Expectancy. The upper boundary of the human life span is 122 years of age (based on the oldest age documented). Chapter 1, p. 7

CHANGING HISTORICAL CIRCUMSTANCES

One historical change involves the age group in which death most often occurs. Two hundred years ago, almost one of every two children died before the age of 10, and one parent died before children grew up. Today, death occurs most often among older adults (Carr, 2009). Life expectancy has increased from 47 years for a person born in 1900 to 78 years for someone born today (U.S. Census Bureau, 2009). In 1900, most people died at home, cared for by their family. As our population has aged and become more mobile, more older adults die apart from their families (Carr, 2009). In the United States today, more than 80 percent of all deaths occur in institutions or hospitals. The care of a dying older person has shifted away from the family and minimized our exposure to death and its painful surroundings.

FIGURE **20.1**

A RITUAL ASSOCIATED WITH DEATH. Family memorial day at the national cemetery in Seoul, South Korea.

Review *Connect* Reflect

LG1 Describe the death system and its cultural and historical contexts.

Review

- What characterizes the death system in a culture? What are some cultural variations in the death system?
- What are some changing sociohistorical circumstances regarding death?

Connect

- You just read about how changes in life expectancy over time have affected our experience of death. In earlier chapters, what did you learn about life expectancy and age span that comprises older adulthood?

Reflect ***Your Own Personal Journey of Life***

- How extensively have death and dying been discussed in your family? Explain.

2 Defining Death and Life/Death Issues

LG2 Evaluate issues in determining death and decisions regarding death.

Issues in Determining Death

Decisions Regarding Life, Death, and Health Care

Is there one point in the process of dying that is *the* point at which death takes place, or is death a more gradual process? What are some decisions individuals can make about life, death, and health care?

ISSUES IN DETERMINING DEATH

Twenty-five years ago, determining if someone was dead was simpler than it is today. The end of certain biological functions, such as breathing and blood pressure, and the rigidity of the body (rigor mortis) were considered to be clear signs of death. In recent decades, defining death has become more complex (Zamperetti & Bellomo, 2009).

Brain death is a neurological definition of death, which states that a person is brain dead when all electrical activity of the brain has ceased for a specified period of time. A flat EEG (electroencephalogram) recording for a specified period of time is one criterion of brain death. The higher portions of the brain often die sooner than the lower portions. Because the brain's lower portions monitor heartbeat and respiration, individuals whose higher brain areas have died may continue breathing and have a heartbeat. The definition of brain death currently followed by most physicians includes the death of both the higher cortical functions and the lower brain stem functions (Truog, 2008).

Some medical experts argue that the criteria for death should include only higher cortical functioning. If the cortical death definition were adopted, then physicians could declare a person is dead when there is no cortical functioning in that person, even though the lower brain stem is functioning. Supporters of the cortical death policy argue that the functions we associate with being human, such as intelligence and personality, are located in the higher cortical part of the brain. They believe that when these functions are lost, the "human being" is no longer alive.

What are some issues in determining death?

DECISIONS REGARDING LIFE, DEATH, AND HEALTH CARE

In cases of catastrophic illness or accidents, patients might not be able to respond adequately to participate in decisions about their medical care. To prepare for this situation, some individuals make choices earlier.

Natural Death Act and Advance Directive For many patients in a coma, it has not been clear what their wishes regarding termination of treatment might be if they still were conscious. Recognizing that terminally ill patients might prefer to die rather than linger in a painful or vegetative state, the organization "Choice in Dying" created the living will. This document is designed to be filled in while the individual can still think clearly; it expresses the person's desires regarding extraordinary medical procedures that might be used to sustain life when the medical situation becomes hopeless (Katsetos & Mirarchi, 2010).

Physicians' concerns over malpractice suits and the efforts of people who support the living will concept have produced natural death legislation. Laws in all 50 states now accept advance directives. An *advance directive* states that life-sustaining procedures shall not be used to prolong the life of an individual when death is imminent (Berger, 2010; Bisson & others, 2009). An advance directive must be signed while the individual still is able to think clearly (Levi & Green, 2010; Westphal & McKee,

brain death A neurological definition of death. A person is brain dead when all electrical activity of the brain has ceased for a specified period of time. A flat EEG recording is one criterion of brain death.

2009). A recent study of end-of-life planning revealed that only 15 percent of patients 18 years of age and older had a living will (Clements, 2009). Almost 90 percent of the patients reported that it was important to discuss health care wishes with their family but only 60 percent of them had done so.

Euthanasia

Euthanasia ("easy death") is the act of painlessly ending the lives of individuals who are suffering from an incurable disease or severe disability. Sometimes euthansia is called "mercy killing." Distinctions are made between two types of euthanasia: passive and active.

- **Passive euthanasia** occurs when a person is allowed to die by withholding available treatment, such as withdrawing a life-sustaining device. For example, this might involve turning off a respirator or a heart-lung machine.
- **Active euthanasia** occurs when death is deliberately induced, as when a lethal dose of a drug is injected.

Terri Schiavo (*right*) shown with her mother in an undated photo. *What issues did the Terri Schiavo case raise?*

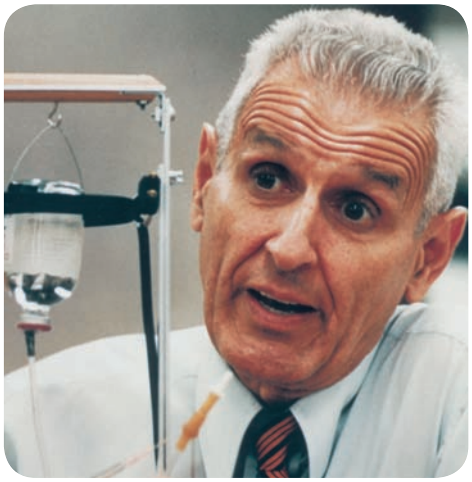
Technological advances in life-support devices raise the issue of quality of life (Durnova & Gottweis, 2010; Givens & Mitchell, 2009). Nowhere was this more apparent than in the highly publicized case of Terri Schiavo, who suffered severe brain damage related to cardiac arrest and a lack of oxygen to the brain. She went into a coma and spent 15 years in a vegetative state. Across the 15 years, whether passive euthanasia should be implemented or whether she should be kept in the vegetative state with the hope that her condition might change for the better was debated between family members and eventually at a number of levels in the judicial system. At one point toward the end of her life in early spring 2005, a court ordered her feeding tube be removed. However, subsequent appeals led to its reinsertion twice. The feeding tube was removed a third and final time on March 18, 2005, and she died 13 days later.

Should individuals like Terri Schiavo be kept alive in a vegetative state? The trend is toward acceptance of passive euthanasia in the case of terminally ill patients (Truog, 2008). However, a recent study revealed that family members were reluctant to have their relatives disconnected from a ventilator but rather wanted an escalation of treatment for them (Sviri & others, 2009). In this study, most of the individuals said that in similar circumstances they would not want to be chronically ventilated or resuscitated.

The inflammatory argument that once equated this practice with suicide rarely is heard today. However, experts do not yet entirely agree on the precise boundaries or the exact mechanisms by which treatment decisions should be implemented (Bartels & Otlowski, 2010; Breitbart, 2010; Manthous, 2009; Seale, 2009). Can a comatose patient's life-support systems be disconnected when the patient has left no written instructions to that effect? Does the family of a comatose patient have the right to overrule the attending physician's decision to continue life-support systems? These questions have no simple or universally agreed-upon answers (Lesser, 2010; van Alphen, Donker, & Marquet, 2010).

The most widely publicized cases of active euthanasia involve "assisted suicide." Jack Kevorkian, a Michigan physician, has assisted a number of terminally ill patients in ending their lives. After a series of trials, Kevorkian was convicted of second-degree murder and given a 10- to 15-year sentence. He was released from prison at age 79 for good behavior in June 2007 and promised not to participate in any further assisted suicides.

Active euthanasia is a crime in most countries and in all states in the United States except Oregon and Washington. In 1994, the state of Oregon passed the Death With Dignity Act, which allows active euthanasia. Through 2001, 91 individuals were known to have died by active euthanasia in Oregon. In January 2006, the U.S. Supreme Court upheld Oregon's active euthanasia law. Active euthanasia is legal in the Netherlands, Belgium, Luxembourg, and Uruguay (Pasman & others, 2009; Smets & others, 2010; Watson, 2009).



Dr. Jack Kevorkian assisted a number of people in Michigan to end their lives through active euthanasia. *Where do you stand on the use of active euthanasia?*

euthanasia The act of painlessly ending the lives of persons who are suffering from incurable diseases or severe disabilities; sometimes called "mercy killing."

passive euthanasia The withholding of available treatments, such as life-sustaining devices, allowing the person to die.

active euthanasia Death induced deliberately, as by injecting a lethal dose of a drug.

Needed: Better Care for Dying Individuals Death in America is often lonely, prolonged, and painful. Dying individuals often get too little or too much care. Scientific advances sometimes have made dying harder by delaying the inevitable. And even though painkillers are available, too many people experience severe pain during the last days and months of life (Alonso-Babarro & others, 2010; Cassell & Rich, 2010). Many health care professionals have not been trained to provide adequate end-of-life care or to understand its importance. A recent study revealed that in many cases doctors don't give dying patients adequate information about how long they are likely to live or how various treatments will affect their lives (Harrington & Smith, 2008). For example, in this study of patients with advanced cancer, only 37 percent of doctors told patients how long they were likely to live.

Care providers are increasingly interested in helping individuals experience a "good death" (Bradley & Brasel, 2009; Carr, 2009; Goodie & McGlory, 2010; Ott, 2010). One view is that a good death involves physical comfort, support from loved ones, acceptance, and appropriate medical care. For some individuals, a good death involves accepting one's impending death and not feeling like a burden to others (Carr, 2009).

There are few fail-safe measures for avoiding pain at the end of life. Still, you can follow these suggestions (Cowley & Hager, 1995):

- Make a living will, and be sure there is someone who will draw your doctor's attention to it.
- Give someone the power of attorney, and make sure this person knows your wishes regarding medical care.
- Give your doctors specific instructions—from "Do not resuscitate" to "Do everything possible"—for specific circumstances.
- If you want to die at home, talk it over with your family and doctor.
- Check to see whether your insurance plan covers home care and hospice care.

What characterizes hospice care?

hospice A program committed to making the end of life as free from pain, anxiety, and depression as possible. The goals of hospice contrast with those of a hospital, which are to cure disease and prolong life.

palliative care Care emphasized in a hospice, which involves reducing pain and suffering and helping individuals die with dignity.

Hospice is a program committed to making the end of life as free from pain, anxiety, and depression as possible (Berry, 2010; Dunn, 2009). Whereas a hospital's goals are to cure illness and prolong life, hospice care emphasizes **palliative care,** which involves reducing pain and suffering and helping individuals die with dignity (Bruera & others, 2010; Chan & Webster, 2010; Zaider & Kissane, 2009). Health care professionals work together to treat the dying person's symptoms, make the individual as comfortable as possible, show interest in the person and the person's family, and help them cope with death (Ireland, 2010; Kahana, Kahana, & Wykle, 2010; Kelly & others, 2009).

The hospice movement began toward the end of the 1960s in London, when a new kind of medical institution, St. Christopher's Hospice, opened. Little effort is made to prolong life at St. Christopher's—there are no heart-lung machines and there is no intensive care unit, for example. A primary goal is to bring pain under control and to help dying patients face death in a psychologically healthy way (McMillan & Small, 2007). The hospice also makes every effort to include the dying individual's family; it is believed that this strategy benefits not only the dying individual but family members as well, probably diminishing their guilt after the death (Kastenbaum, 2009).

The hospice movement has grown rapidly in the United States. More than 1,500 community groups are involved nationally in establishing hospice programs. Hospices are more likely to serve people with terminal cancer than those with other life-threatening conditions (Kastenbaum, 2009). Hospice adovates underscore that it is possible to control pain for almost any dying individual and that it is possible to create an environment for the patient that is superior to that found in most hospitals (Hayslip, 1996). For hospice services to be covered by Medicare, a patient must be deemed by a physician to have six months or fewer to live. Also, some hospice providers require that the patient have a family caregiver in the home (or nearby) before agreeing to provide services for the patient.

Currently, approximately 90 percent of hospice care is provided in patients' homes (Hayslip & Hansson, 2007). In some cases, home-based care is provided by

connecting with careers

Kathy McLaughlin, Home Hospice Nurse

Kathy McLaughlin is a home hospice nurse in Alexandria, Virginia. She provides care for individuals with terminal cancer, Alzheimer disease, and other diseases. There currently is a shortage of home hospice nurses in the United States.

McLaughlin says that she has seen too many people dying in pain, away from home, hooked up to needless machines. In her work as a home hospice nurse, she comments, "I know I'm making a difference, I just feel privileged to get the chance to meet this person who is not going to be around much longer. I want to enjoy the moment with this person. And I want them to enjoy the moment. They have great stories. They are better than novels" (McLaughlin, 2003, p. 1).

Kathy McLaughlin checks the vital signs of Kathryn Francis, 86, who is in an advanced stage of Alzheimer disease.

community-based health care professionals or volunteers; in other cases, home-based care is provided by home-health-care agencies of Visiting Nurse Associations. Also, some hospice care is provided in free-standing, full-service hospice facilities and in hospice units in hospitals. To read about the work of a home hospice nurse, see *Connecting With Careers*.

Review *Connect* Reflect

LG2 Evaluate issues in determining death and decisions regarding death.

Review

- What are some issues regarding the determination of death?
- What are some decisions to be made regarding life, death, and health care?

Connect

- In this section, you learned that one of the things that hospices try to provide dying patients is adequate pain management. What did you learn about older adults in Chapter 17 that might help them deal with pain better than younger adults?

Reflect *Your Own Personal Journey of Life*

- Have you signed an advance directive (living will)? Why or why not?

3 A Developmental Perspective on Death

LG3 Discuss death and attitudes about it at different points in development.

Causes of Death

Attitudes Toward Death at Different Points in the Life Span

Do the causes of death vary across the human life span? Do we have different expectations about death as we develop through the life span? What are our attitudes toward death at different points in our development?

CAUSES OF DEATH

Death can occur at any point in the human life span. Death can occur during prenatal development through miscarriages or stillborn births. Death can also occur

developmental **connection**

Conditions, Diseases, and Disorders. Nearly 3,000 deaths of infants a year in the U.S. are attributed to SIDS. Chapter 4, p. 118

during the birth process or in the first few days after birth, which usually happens because of a birth defect or because infants have not developed adequately to sustain life outside the uterus. In Chapter 4, "Physical Development in Infancy," we described *sudden infant death syndrome (SIDS),* in which infants stop breathing, usually during the night, and die without apparent cause (Dwyer & Ponsonby, 2009; Ostfeld & others, 2010). SIDS currently is the leading cause of infant death in the United States, with the risk highest at 2 to 4 months of age (NICHD, 2010).

In childhood, death occurs most often because of accidents or illness. Accidental death in childhood can be the consequence of such things as an automobile accident, drowning, poisoning, fire, or a fall from a high place. Major illnesses that cause death in children are heart disease, cancer, and birth defects.

Compared with childhood, death in adolescence is more likely to occur because of motor vehicle accidents, suicide, and homicide. Many motor vehicle accidents that cause death in adolescence are alcohol-related. We will examine suicide in greater depth shortly.

Older adults are more likely to die from chronic diseases, such as heart disease and cancer, whereas younger adults are more likely to die from accidents. Older adults' diseases often incapacitate before they kill, which produces a course of dying that slowly leads to death. Of course, many young and middle-aged adults also die of heart disease, cancer, and other diseases.

ATTITUDES TOWARD DEATH AT DIFFERENT POINTS IN THE LIFE SPAN

The ages of children and adults influence the way they experience and think about death. A mature, adultlike conception of death includes an understanding that death is final and irreversible, that death represents the end of life, and that all living things die. Most researchers have found that as children grow, they develop a more mature approach to death (Hayslip & Hansson, 2003).

Childhood Young children do not perceive time the way adults do. Even brief separations may be experienced as total losses. For most infants, the reappearance of the caregiver provides a continuity of existence and a reduction of anxiety. We know very little about the infant's actual experiences with bereavement, although the loss of a parent, especially if the caregiver is not replaced, can negatively affect the infant's health.

Even children 3 to 5 years of age have little or no idea of what death means. They may confuse death with sleep or ask in a puzzled way, "Why doesn't it move?" Preschool-aged children rarely get upset by the sight of a dead animal or by being told that a person has died. They believe that the dead can be brought back to life spontaneously by magic or by giving them food or medical treatment. Young children often believe that only people who want to die, or who are bad or careless, actually die. They also may blame themselves for the death of someone they know well, illogically reasoning that the event may have happened because they disobeyed the person who died.

Sometime in the middle and late childhood years, more realistic perceptions of death develop. In a review of research on children's conception of death, it was concluded that children probably do not view death as universal and irreversible until about 9 years of age (Cuddy-Casey & Orvaschel, 1997). Most children under 7 do not see death as likely. Those who do, perceive it as reversible.

The death of a parent is especially difficult for children (Sood & others, 2006). When a child's parent dies, the child's

Three- to nine-year-old children with their mother visiting their father's grave in Kenya. *What are some developmental changes in children's conceptions of death?*

school performance and peer relationships often worsen. For some children, as well as adults, a parent's death can be devastating and result in a hypersensitivity about death, including a fear of losing others close to the individual. In some cases, loss of a sibling can result in similar negative outcomes (Sood & others, 2006). However, a number of factors, such as the quality of the relationship and type of the death (whether due to an accident, long-standing illness, suicide, or murder, for example), can influence the individual's development following the death of a person close to the individual.

Most psychologists emphasize that honesty is the best strategy in discussing death with children. Treating the concept as unmentionable is thought to be an inappropriate strategy, yet most of us have grown up in a society in which death is rarely discussed.

In addition to honesty, the best response to the child's query about death might depend on the child's maturity level. For example, the preschool child requires a less elaborate explanation than an older child. Death can be explained to preschool children in simple physical and biological terms. Actually, what young children need more than elaborate explanations of death is reassurance that they are loved and will not be abandoned. Regardless of children's age, adults should be sensitive and sympathetic, encouraging them to express their own feelings and ideas.

It is not unusual for terminally ill children to distance themselves from their parents as they approach the final phase of their illness. The distancing may be due to the depression that many dying patients experience, or it may be a child's way of protecting parents from the overwhelming grief they will experience at the death. Most dying children know they have a terminal illness. Their developmental level, social support, and coping skills influence how well they cope with knowing they will die.

What are children's and adolescents' attitudes about death?

Adolescence In adolescence, the prospect of death, like the prospect of aging, is regarded as remote and death may be avoided, glossed over, or kidded about. This perspective is typical of the adolescent's self-conscious thought; however, some adolescents do show a concern for death, both in trying to fathom its meaning and in confronting the prospect of their own demise.

Deaths of friends, siblings, parents, or grandparents bring death to the forefront of adolescents' lives. Deaths of peers who commit suicide "may be especially difficult for adolescents who feel . . . guilty for having failed to prevent the suicide or feel that they should have died, or . . . feel they are being rejected by their friends who hold them responsible for the death (Hayslip & Hansson, 2003, p. 441).

Adolescents develop more abstract conceptions of death than children do. For example, adolescents describe death in terms of darkness, light, transition, or nothingness (Wenestam & Wass, 1987). They also develop religious and philosophical views about the nature of death and whether there is life after death.

Recall from Chapter 11 adolescents' concepts of egocentrism and personal fable—that is, adolescents' preoccupation with themselves and their belief that they are invincible and unique. Thus, it is not unusual for some adolescents to think that they are somehow immune to death and that death is something that happens to other people but not to them. However, as we indicated in Chapter 11, some research studies suggest that rather than perceiving themselves to be invulnerable, adolescents tend to portray themselves as vulnerable to experiencing a premature death (Fischhoff & others, 2010; Reyna & Rivers, 2008).

developmental **connection**

Cognitive Theory. In Piaget's theory, adolescents think more abstractly, idealistically, and logically than do children. Chapter 11, p. 370

Adulthood There is no evidence that a special orientation toward death develops in early adulthood. An increase in consciousness about death accompanies individuals' awareness that they are aging, which usually intensifies in middle adulthood. In our discussion of middle adulthood, we indicated that midlife is a

How might older adult's attitudes about death differ from those of younger adults?

time when adults begin to think more about how much time is left in their lives. Researchers have found that middle-aged adults actually fear death more than do young adults or older adults (Kalish & Reynolds, 1976). Older adults, though, think about death more and talk about it more in conversation with others than do middle-aged and young adults. They also have more direct experience with death as their friends and relatives become ill and die (Hayslip & Hansson, 2003). Older adults are forced to examine the meanings of life and death more frequently than are younger adults.

Younger adults who are dying often feel cheated more than do older adults who are dying (Kalish, 1987). Younger adults are more likely to feel they have not had the opportunity to do what they want to with their lives. Younger adults perceive they are losing what they might achieve; older adults perceive they are losing what they have.

In old age, one's own death may take on an appropriateness it lacked in earlier years. Some of the increased thinking and conversing about death, and an increased sense of integrity developed through a positive life review, may help older adults accept death. Older adults are less likely to have unfinished business than are younger adults. They usually do not have children who need to be guided to maturity, their spouses are more likely to be dead, and they are less likely to have work-related projects that require completion. Lacking such anticipations, death may be less emotionally painful to them. Even among older adults, however, attitudes toward death vary.

> We keep on thinking and rethinking death after we have passed through childhood's hour.
>
> —ROBERT KASTENBAUM
>
> *Contemporary Gerontologist, Arizona State University*

Review *Connect* Reflect

LG3 Discuss death and attitudes about it at different points in development.

Review

- What are some developmental changes in the cause of death?
- What are some attitudes about death at different points in development?

Connect

- In this section, you learned that children 3 to 5 years of age often believe that the dead can be brought back to life spontaneously by magic or by giving them food or medical treatment. During which of Piaget's stages of development is a child's cognitive world dominated by egocentrism and magical beliefs?

Reflect *Your Own Personal Journey of Life*

- What is your current attitude about death? Has it changed since you were an adolescent? If so, how?

4 Facing One's Own Death

LG4 Explain the psychological aspects involved in facing one's own death and the contexts in which people die.

Kübler-Ross' Stages of Dying

Perceived Control and Denial

The Contexts in Which People Die

Knowledge of death's inevitability permits us to establish priorities and structure our time accordingly. As we age, these priorities and structurings change in recognition of diminishing future time. Values concerning the most important uses of time also change. For example, when asked how they would spend their six remaining months of life, younger adults described such activities as traveling and accomplishing things they previously had not done; older adults described more inner-focused activities—contemplation and meditation, for example (Kalish & Reynolds, 1976).

denial and isolation Kübler-Ross' first stage of dying, in which the dying person denies that she or he is really going to die.

anger Kübler-Ross' second stage of dying, in which the dying person's denial gives way to anger, resentment, rage, and envy.

Most dying individuals want an opportunity to make some decisions regarding their own life and death (Kastenbaum, 2009). Some individuals want to complete unfinished business; they want time to resolve problems and conflicts and to put their affairs in order.

A recent study examined the concerns of 36 dying individuals from 38 to 92 years of age with a mean age of 68 (Terry & others, 2006). The three areas of concern that consistently appeared were (1) privacy and autonomy, mainly in regard to their families; (2) inadequate information about physical changes and medication as they approached death; (3) the motivation to shorten their life, which was indicated by all patients.

KÜBLER-ROSS' STAGES OF DYING

Might there be a sequence of stages we go through as we face death? Elisabeth Kübler-Ross (1969) divided the behavior and thinking of dying persons into five stages: denial and isolation, anger, bargaining, depression, and acceptance.

Denial and isolation is Kübler-Ross' first stage of dying, in which the person denies that death is really going to take place. The person may say, "No, it can't be me. It's not possible." This is a common reaction to terminal illness. However, denial is usually only a temporary defense. It is eventually replaced with increased awareness when the person is confronted with such matters as financial considerations, unfinished business, and worry about surviving family members.

Anger is Kübler-Ross' second stage of dying, in which the dying person recognizes that denial can no longer be maintained. Denial often gives way to anger, resentment, rage, and envy. The dying person's question is, "Why me?" At this point, the person becomes increasingly difficult to care for as anger may become displaced and projected onto physicians, nurses, family members, and even God. The realization of loss is great, and those who symbolize life, energy, and competent functioning are especially salient targets of the dying person's resentment and jealousy.

Bargaining is Kübler-Ross' third stage of dying, in which the person develops the hope that death can somehow be postponed or delayed. Some persons enter into a bargaining or negotiation—often with God—as they try to delay their death. Psychologically, the person is saying, "Yes, me, but . . ." In exchange for a few more days, weeks, or months of life, the person promises to lead a reformed life dedicated to God or to the service of others.

Depression is Kübler-Ross' fourth stage of dying, in which the dying person comes to accept the certainty of death. At this point, a period of depression or preparatory grief may appear. The dying person may become silent, refuse visitors, and spend much of the time crying or grieving. This behavior is normal and is an effort to disconnect the self from love objects. Attempts to cheer up the dying person at this stage should be discouraged, says Kübler-Ross, because the dying person has a need to contemplate impending death.

Acceptance is Kübler-Ross' fifth stage of dying, in which the person develops a sense of peace, an acceptance of one's fate, and in many cases, a desire to be left alone. In this stage, feelings and physical pain may be virtually absent. Kübler-Ross describes this fifth stage as the end of the dying struggle, the final resting stage before death. A summary of Kübler-Ross' dying stages is presented in Figure 20.2.

What is the current evaluation of Kübler-Ross' approach? According to Robert Kastenbaum (2009), there are some problems with Kübler-Ross' approach:

- The existence of the five-stage sequence has not been demonstrated by either Kübler-Ross or independent research.
- The stage interpretation neglected the patients' situations, including relationship support, specific effects of illness, family obligations, and institutional climate in which they were interviewed.

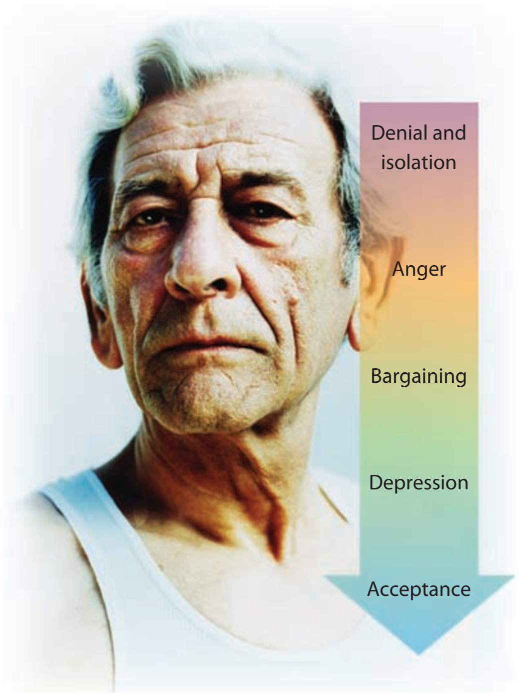


FIGURE **20.2**

KÜBLER-ROSS' STAGES OF DYING. According to Elisabeth Kübler-Ross, we go through five stages of dying: denial and isolation, anger, bargaining, depression, and acceptance. *Does everyone go through these stages, or go through them in the same order? Explain.*

Sustained and soothed by an unfaltering trust, approach thy grave, Like one who wraps the drapery of his couch About him, and lies down to pleasant dreams.

—William Cullen Bryant

American Poet, 19th Century

bargaining Kübler-Ross' third stage of dying, in which the dying person develops the hope that death can somehow be postponed.

depression Kübler-Ross' fourth stage of dying, in which the dying person comes to accept the certainty of her or his death. A period of depression or preparatory grief may appear.

acceptance Kübler-Ross' fifth stage of dying, in which the dying person develops a sense of peace, an acceptance of her or his fate, and, in many cases, a desire to be left alone.

However, Kübler-Ross' pioneering efforts were important in calling attention to those who are attempting to cope with life-threatening illnesses. She did much to encourage attention to the quality of life for dying persons and their families.

Because of the criticisms of Kübler-Ross' stages, some psychologists prefer to describe them not as stages but as potential reactions to dying. At any one moment, a number of emotions may wax and wane. Hope, disbelief, bewilderment, anger, and acceptance may come and go as individuals try to make sense of what is happening to them.

> Man is the only animal that finds his own existence a problem he has to solve and from which he cannot escape. In the same sense man is the only animal who knows he must die.
>
> —Erich Fromm
>
> *American Psychotherapist, 20th Century*

In facing their own death, some individuals struggle until the end, desperately trying to hang on to their lives. Acceptance of death never comes for them. Some psychologists believe that the harder individuals fight to avoid the inevitable death they face and the more they deny it, the more difficulty they will have in dying peacefully and in a dignified way; other psychologists argue that not confronting death until the end may be adaptive for some individuals (Lifton, 1977).

The extent to which people have found meaning and purpose in their lives is linked with how they approach death (Carr, 2009). A recent study revealed that individuals with a chronic, life-threatening illness—congestive heart failure—were trying to understand meaning in life (Park & others, 2008). In another study, individuals with less than three months to live who had found purpose and meaning in their lives felt the least despair in the final weeks, whereas dying individuals who saw no reason for living were the most distressed and wanted to hasten death (McClain, Rosenfeld, & Breitbart, 2003). In this and other studies, spirituality helped to buffer dying individuals from severe depression (Smith, McCullough, & Poll, 2003).

developmental **connection**

Religion. Religion can provide some important psychological needs in older adults, helping them face impending death and accept the inevitable losses in old age. Chapter 18, p. 587

Do individuals become more spiritual as they get closer to death? A recent study of more than 100 patients with advanced congestive heart failure who were studied at two times six months apart found that as the patients perceived they were closer to death, they became more spiritual (Park, 2009).

PERCEIVED CONTROL AND DENIAL

Perceived control may work as an adaptive strategy for some older adults who face death. When individuals are led to believe they can influence and control events—such as prolonging their lives—they may become more alert and cheerful. Remember from Chapter 17 that giving nursing home residents options for control improved their attitudes and increased their longevity (Rodin & Langer, 1977).

Denial also may be a fruitful way for some individuals to approach death. It can be adaptive or maladaptive. Denial can be used to avoid the destructive impact of shock by delaying the necessity of dealing with one's death. Denial can insulate the individual from having to cope with intense feelings of anger and hurt; however, if denial keeps us from having a life-saving operation, it clearly is maladaptive. Denial is neither good nor bad; its adaptive qualities need to be evaluated on an individual basis.

THE CONTEXTS IN WHICH PEOPLE DIE

For dying individuals, the context in which they die is important. More than 50 percent of Americans die in hospitals, and nearly 20 percent die in nursing homes. Some people spend their final days in isolation and fear (Clay, 1997). An increasing number of people choose to die in the humane atmosphere of a hospice.

Hospitals offer several important advantages to the dying individual; for example, professional staff members are readily available, and the medical technology present may prolong life. But a hospital may not be the best place for many people to die (Pantilat & Isaac, 2008). Most individuals say they would rather die at home (Jackson & others, 2010; Kalish & Reynolds, 1976). Many feel, however, that they will be a burden at home, that there is limited space there, and that dying at home may alter relationships. Individuals who are facing death also worry about the competency and availability of emergency medical treatment if they remain at home.

Review **Connect** Reflect

LG4 Explain the psychological aspects involved in facing one's own death and the contexts in which people die.

Review

- What are Kübler-Ross' five stages of dying? What conclusions can be reached about them?
- What roles do perceived control and denial play in facing one's own death?
- What are the contexts in which people die?

Connect

- In this section, you learned that the extent to which people have found meaning and purpose in their lives is linked with how they approach death. In Chapter 15, what did Roy Baumeister and Kathleen Vohs say are the four main needs for meaning that guide how people try to make sense of their lives?

Reflect *Your Own Personal Journey of Life*

- How do you think you will psychologically handle facing your own death?

5 Coping With the Death of Someone Else

LG5 Identify ways to cope with the death of another person.

- Communicating With a Dying Person
- Grieving
- Making Sense of the World
- Losing a Life Partner
- Forms of Mourning

Loss can come in many forms in our lives—divorce, a pet's death, loss of a job—but no loss is greater than that which comes through the death of someone we love and care for—a parent, sibling, spouse, relative, or friend. In the ratings of life's stresses that require the most adjustment, death of a spouse is given the highest number. How should we communicate with a dying individual? How do we cope with the death of someone we love?

COMMUNICATING WITH A DYING PERSON

Most psychologists argue that it is best for dying individuals to know that they are dying and that significant others know they are dying so they can interact and communicate with each other on the basis of this mutual knowledge (Banja, 2005). What are some of the advantages of this open awareness for the dying individual? First, dying individuals can close their lives in accord with their own ideas about proper dying. Second, they may be able to complete some plans and projects, can make arrangements for survivors, and can participate in decisions about a funeral and burial. Third, dying individuals have the opportunity to reminisce, to converse with others who have been important in their life, and to end life conscious of what life has been like. And fourth, dying individuals have more understanding of what is happening within their bodies and what the medical staff is doing to them (Kalish, 1981).

In addition to keeping communication open, some experts reason that conversation should not focus on mental pathology or preparation for death but should focus on strengths of the individual and preparation for the remainder of life. Since external accomplishments are not possible, communication should be directed more at internal growth. Keep in mind also that important support for a dying individual may come not only from mental health professionals, but also from nurses, physicians, a spouse, or intimate friends. In *Connecting Development to Life*, you can read further about effective communication strategies with a dying person.

connecting development to life

Effective Strategies for Communicating With a Dying Person

The following are effective strategies for communicating with a dying person:

- Establish your presence, be at the same eye level; don't be afraid to touch the dying person—dying individuals are often starved for human touch.
- Eliminate distraction—for example, ask if it is okay to turn off the TV. Realize that excessive small talk can be a distraction.
- Dying individuals who are very frail often have little energy. If the dying person you are visiting is very frail, you may not want to visit for very long.
- Don't insist that the dying person feel acceptance about death if the dying person wants to deny the reality of the situation; on the other hand, don't insist on denial if the dying individual indicates acceptance.
- Allow the dying person to express guilt or anger; encourage the expression of feelings.
- Don't be afraid to ask the person what the expected outcome for the illness is. Discuss alternatives, unfinished business.
- Sometimes dying individuals don't have access to other people. Ask the dying person if there is anyone he or she would like to see that you can contact.
- Encourage the dying individual to reminisce, especially if you have memories in common.
- Talk with the individual when she or he wishes to talk. If this is impossible, make an appointment and keep it.
- Express your regard for the dying individual. Don't be afraid to express love, and don't be afraid to say good-bye.

What are some good strategies for communicating with a dying person?

GRIEVING

Our exploration of grief focuses on dimensions of grieving, the dual-process model of coping with bereavement, and cultural diversity in healthy grieving.

Everyone can master grief but he who has it.

—William Shakespeare
English Playwright, 17th Century

Dimensions of Grieving **Grief** is the emotional numbness, disbelief, separation anxiety, despair, sadness, and loneliness that accompany the loss of someone we love. Grief is not a simple emotional state but rather a complex, evolving process with multiple dimensions. In this view, pining for the lost person is one important dimension. Pining or yearning reflects an intermittent, recurrent wish or need to recover the lost person. A recent study revealed that the death of a loved one is most frequently followed by yearning and acceptance with most of the negative feelings associated with the death diminishing by six months after the death (Maciejewski & others, 2007). In this study, yearning was more common than depression following a loved one's death. Another important dimension of grief is separation anxiety, which not only includes pining and preoccupation with thoughts of the deceased person but also focuses on places and things associated with the deceased, as well as crying or sighing. Grief may also involve despair and sadness, which include a sense of hopelessness and defeat, depressive symptoms, apathy, loss of meaning for activities that used to involve the person who is gone, and growing desolation (Chiambretto & others, 2010).

grief The emotional numbness, disbelief, separation anxiety, despair, sadness, and loneliness that accompany the loss of someone we love.

These feelings occur repeatedly shortly after a loss (Moules & others, 2004). As time passes, pining and protest over the loss tend to diminish, although episodes of depression and apathy may remain or increase. The sense of separation anxiety and loss may continue to the end of one's life, but most of us emerge from grief's tears, turning our attention once again to productive tasks and regaining a more positive view of life (Carrington & Bogetz, 2004). A recent study of almost 300 recently widowed men and women revealed that in the course of their bereavement experiencing humor, laughter, and happiness was strongly related to more favorable bereavement adjustment (lower levels of grief and depression) (Lund & others, 2008–2009).

The grieving process is more like a roller-coaster ride than an orderly progression of stages with clear-cut time frames (Lund, 2007). The ups and downs of grief often involve rapidly changing emotions, meeting the challenges of learning new skills, detecting personal weaknesses and limitations, creating new patterns of behavior, and forming new friendships and relationships (Feldon, 2003). For most individuals, grief becomes more manageable over time, with fewer abrupt highs and lows. But many grieving spouses report that even though time has brought some healing, they have never gotten over their loss. They have just learned to live with it.

Cognitive factors are involved in the severity of grief after a loved one has died. One study focused on 329 adults who had suffered the loss of a first-degree relative (Boelen, van den Bout, & van den Hout, 2003). The more negative beliefs and self-blame the adults had, the more severe were their symptoms of traumatic grief, depression, and anxiety.

Long-term grief is sometimes masked and can predispose individuals to become depressed and even suicidal (Wellisch & others, 2010; Zanni & Wick, 2010). Good family communication can help reduce the incidence of depression and suicidal thoughts. An estimated 80 to 90 percent of survivors experience normal or uncomplicated grief reactions that include sadness and even disbelief or considerable anguish. By six months after their loss, they accept it as a reality, are more optimistic about the future, and function competently in their everyday lives. However, six months after their loss, approximately 10 to 20 percent of survivors have difficulty moving on with their life, feel numb or detached, believe their life is empty without the deceased, and feel that the future has no meaning. Initially referred to as complicated grief, leading expert Holly Prigerson and her colleagues (Boelen & Prigerson, 2007; Chiambretto & others, 2010; Maciejewski & others, 2007) recently have advocated use of the term **prolonged grief** to describe this type of grief that involves enduring despair and is still unresolved over an extended period of time. Prolonged grief usually has negative consequences on physical and mental health (Kersting & Kroker, 2010; Kersting & others, 2009). A person who loses someone he or she was emotionally dependent on is often at greatest risk for developing prolonged grief (Johnson & others, 2007). One study found that therapy focused on motivational interviewing, emotion coping, and communication skills was effective in reducing prolonged grief (Zuckoff & others, 2006). Also, recent research indicated that African Americans experienced more prolonged grief than non-Latino Whites (Goldsmith & others, 2008).

Another type of grief is *disenfranchised grief,* which describes an individual's grief over a deceased person that is a socially ambiguous loss that can't be openly mourned or supported (Aloi, 2009; Hendry, 2009). Examples of disenfranchised grief include a relationship that isn't socially recognized such as an ex-spouse, a hidden loss such as an abortion, and circumstances of the death that are stigmatized such as death because of AIDS. Disenfranchised grief may intensify an individual's grief because it cannot be publicly acknowledged. This type of grief may be hidden or repressed for many years, only to be reawakened by later deaths.

Dual-Process Model of Coping with Bereavement The **dual-process model** of coping with bereavement consists of two main dimensions: (1) loss-oriented stressors, and (2) restoration-oriented stressors (Stroebe, Schut, & Boerner, 2010;

What are some different types of grief?

prolonged grief Grief that involves enduring despair and is still unresolved over an extended period of time.

dual-process model A model of coping with bereavement that emphasizes oscillation between two dimensions: (1) loss-oriented stressors, and (2) restoration-oriented stressors.

Stroebe, Schut, & Stroebe, 2005). Loss-oriented stressors focus on the deceased individual and can include grief work and both positive and negative reappraisals of the loss. A positive reappraisal of the loss might include acknowledging that death brought relief at the end of suffering, whereas a negative reappraisal might involve yearning for the loved one and rumination about the death. Restoration-oriented stressors involve the secondary stressors that emerge as indirect outcomes of bereavement. They can include a changing identity (such as from "wife" to "widow") and mastering skills (such as dealing with finances). Restoration rebuilds "shattered assumptions about the world and one's own place in it."

In the dual-process model, effective coping with bereavement often involves an oscillation between coping with loss and coping with restoration (Bennett, 2009; Wijngaards-de Meij & others, 2008). Earlier models often emphasized a sequence of coping with loss through such strategies as grief work as an initial phase, followed by restoration efforts. However, in the dual-process model, coping with loss and engaging in restoration can be carried out concurrently (Richardson, 2007). According to this model, the person coping with death might be involved in grief group therapy while settling the affairs of the loved one. Oscillation might occur in the short term during a particular day as well as across weeks, months, and even years. Although loss and restoration coping can occur concurrently, over time there often is an initial emphasis on coping with loss followed by greater emphasis on restoration (Milberg & others, 2008).

Coping and Type of Death The impact of death on surviving individuals is strongly influenced by the circumstances under which the death occurs (Smith & others, 2009). Deaths that are sudden, untimely, violent, or traumatic are likely to have more intense and prolonged effects on surviving individuals and make the coping process more difficult for them (Sveen & Walby, 2008). Such deaths often are accompanied by post-traumatic stress disorder (PTSD) symptoms, such as intrusive thoughts, flashbacks, nightmares, sleep disturbance, problems in concentrating, and others. Death of a child can be especially devastating and extremely difficult for parents to cope with (De Lisele-Porter & Podruchney, 2009; Edwards & others, 2009).

Cultural Diversity in Healthy Grieving Some approaches to grieving emphasize the importance of breaking bonds with the deceased and returning to autonomous lifestyles. People who persist in holding on to the deceased are believed to be in need of therapy. However, some doubt has been cast on whether this recommendation is always the best therapeutic advice (Reisman, 2001).

Analyses of non-Western cultures suggest that beliefs about continuing bonds with the deceased vary extensively. Maintenance of ties with the deceased is accepted and sustained in the religious rituals of Japan. In the Hopi of Arizona, the deceased are forgotten as quickly as possible and life is carried on as usual. Their funeral ritual concludes with a break-off between mortals and spirits. The diversity of grieving is nowhere more clear than in two Muslim societies—one in Egypt, the other in Bali. In Egypt, the bereaved are encouraged to dwell at length on their grief, surrounded by others who relate similarly tragic accounts and express their own sorrow. By contrast, in Bali, the bereaved are encouraged to laugh and be joyful.

Consider also the responses of parents whose sons died in two Israeli wars, 13 and 4 years earlier (Rubin & Malkinson, 2001; Schuchter & Zisook, 1993). Even many years after the death of their sons, the Israeli parents showed a strong involvement with them. They idealized the lost sons in ways that were not present in the descriptions by a control group of parents of sons who had recently left home.

How might grieving vary across individuals and cultures?

In sum, people grieve in a variety of ways (Carr, 2009). The diverse grieving patterns are culturally embedded practices. Thus, there is no one right, ideal way to grieve. There are many different ways to feel about a deceased person and no set series of stages that the bereaved must pass through to become well adjusted. The stoic widower may need to cry out over his loss at times. The weeping widow may need to put her husband's wishes aside as she becomes the financial manager of her estate. What is needed is an understanding that healthy coping with the death of a loved one involves growth, flexibility, and appropriateness within a cultural context.

MAKING SENSE OF THE WORLD

Not only do many individuals who face death search for meaning in life, so do the many bereaved individuals (Carr, 2009; Park, 2009). One beneficial aspect of grieving is that it stimulates many individuals to try to make sense of their world (Kalish, 1981). A common occurrence is to go over again and again all of the events that led up to the death. In the days and weeks after the death, the closest family members share experiences with each other, sometimes reminiscing over family experiences. In one study, women who became widowed in midlife were challenged by the crisis of their husband's death to examine meaningful directions for their lives (Danforth & Glass, 2001). Another study found that mourners who expressed positive themes of hope showed better adjustment than those who focused on negative themes of pain and suffering (Gamino & Sewell, 2004). And a recent study revealed that finding meaning in the death of a spouse was linked to a lower level of anger during bereavement (Kim, 2009).

When a death is caused by an accident or a disaster, the effort to make sense of it is pursued more vigorously. As added pieces of news come trickling in, they are integrated into the puzzle. The bereaved want to put the death into a perspective that they can understand—divine intervention, a curse from a neighboring tribe, a logical sequence of cause and effect, or whatever it may be. A recent study of more than 1,000 college students found that making sense was an important factor in their grieving of a violent loss by accident, homicide, or suicide (Currier, Holland, & Neimeyer, 2006).

developmental **connection**

Stress. Meaning-making coping involves drawing on beliefs, values, and goals to change the meaning of a stressful situation, especially in times of chronic stress as when a loved one dies. Chapter 15, p. 496

LOSING A LIFE PARTNER

In the United States, 14 percent of men and 42 percent of women 65 years of age and older were widowed in 2008 (Administration on Aging, 2009). Those left behind after the death of an intimate partner often suffer profound grief and often endure financial loss, loneliness, increased physical illness, and psychological disorders, including depression (Kowalski & Bondmass, 2008). How surviving spouses cope varies considerably (Ott & others, 2007). A six-year longitudinal study of individuals 80 years of age and older found that the loss of a spouse, especially in men, was related to a lower level of life satisfaction over time (Berg & others, 2009). However, another study revealed that nearly half of surviving spouses experienced low levels of distress from three years predeath to 18 months postdeath (Bonanno, Wortman, & Nesse, 2004). In yet another study, widowed individuals were more likely to increase their religious and spiritual beliefs following the death of a spouse, and this increase was linked with a lower level of grief (Brown & others, 2004). And one study concluded that chronic grief was more likely to characterize bereaved spouses who were highly dependent on their spouse (Ott & others, 2007).

Widows outnumber widowers because women live longer than men, because women tend to marry men older than themselves, and because a widowed man is more likely to remarry. Widowed women are probably

These restaurant workers, who lost their jobs on 9/11/01, have made a bittersweet return with a New York restaurant they call their own. Colors, named for the many nationalities and ethnic groups among its owners, is believed to be the city's first cooperative restaurant. World famous restaurant Windows on the World was destroyed and 73 workers killed when the Twin Towers were destroyed by terrorists. The former Windows survivors at the new venture will split 60% of the profits between themselves and the rest will be given to a fund to open other cooperative restaurants.

connecting through research

What Are Some Connections Between Marital Status and Length of Widowhood and Health in Women?

One three-year longitudinal study of more than 130,000 women aged 50 to 79 years in the United States as part of the Women's Health Initiative examined the relation of widowhood to physical and mental health, health behaviors, and health outcomes (Wilcox & others, 2003). Women were categorized as (1) remaining married, (2) transitioning from married to widowed, (3) remaining widowed, and (4) transitioning from widowed to married. Widows were further subdivided into the recently widowed (widowed for less than one year) and longer-term widowed (widowed for more than one year).

The measures used to assess the older women's health were:

- *Physical health.* Blood pressure was assessed after five minutes of quiet rest using the average of two readings with 30 seconds between the readings. Hypertension was defined as more than 140/90. Body mass index (BMI) was calculated and used to determine whether a woman was obese. A health survey assessed physical function and health status.
- *Mental health.* Depressive symptoms were assessed by a six-item depression scale, with participants rating the frequency of their depressed thoughts during the past week. The participants' self-report of antidepressant medicine use was also obtained. Information about social functioning and mental health was based on participants' responses on the Social Functioning Scale (Ware, Kosinski, & Dewey, 2000).
- *Health behaviors.* Dietary behaviors were assessed with a modified version of the National Cancer Institute—Health Habits and History Questionnaire. Participants also were asked if they smoked tobacco, and if so, how much. To assess physical activity, participants were asked how often they walked outside the home each week and the extent to which they engaged in strenuous or moderate exercise. To assess health care use, they were asked whether they had visited their doctor in the past year.
- *Health outcomes.* Cardiovascular disease and cancer occurrences were assessed annually and any overnight hospitalizations were noted.

At the beginning of the three-year study, married women reported better physical and mental health, and better health in general, than widowed women. Women who remained married over the three-year period of the study showed stability in mental health, recent widows experienced marked impairments in mental health, and longer-term widows showed stability or slight improvements in mental health. Both groups of widows (recent and longer-term) reported more unintentional weight loss across the three years.

The findings underscore the resilience of older women and their capacity to reestablish connections but also point to the need for services that strengthen social support for those who have difficulty during the transition from marriage to widowhood.

the poorest group in America. And the negative economic consequences for widowed women are greater for African American and Latino women than for non-Latino White women (Angel, Jimenez, & Angel, 2007).

Many widows are lonely (Lund, 2007). The poorer and less educated they are, the lonelier they tend to be. The bereaved are also at increased risk for many health problems, including death (Elwert & Christakis, 2008; Holtslander & Duggleby, 2010). What are some connections between marital status and length of widowhood and health in women? The above *Connecting Through Research* examines the relation of widowhood to health.

Optimal adjustment after a death depends on several factors. Women do better than men largely because in our society women are responsible for the emotional life of a couple, whereas men usually manage the finances and material goods (Fry, 2001). Thus, women have better networks of friends, closer relationships with relatives, and experience in taking care of themselves psychologically (Antonucci, Akiyama, & Sherman, 2007). Older widows do better than younger widows, perhaps because the death of a partner is more expected for older women. For their part, widowers usually have more money than widows do, and they are much more likely to remarry. However, a recent study of older adults revealed that widowhood was linked to a higher risk of depression in men than in women (Mechakra-Tahiri & others, 2010).

developmental **connection**

Community and Culture. For older adults, social support is linked with a reduction in the symptoms of disease and mortality. Chapter 19, p. 610

For either widows or widowers, social support helps them adjust to the death of a spouse (Bennett, 2009). The Widow-to-Widow program, begun in the 1960s, provides support for newly widowed women. Volunteer widows reach out to other widows, introducing them to others who may have similar problems, leading group discussions, and organizing social activities. The program has been adopted by the American Association of Retired Persons and disseminated throughout the United States as the Widowed Person's Service. The model has since been adopted by numerous community organizations to provide support for those going through a difficult transition. Other widow support groups also are often beneficial in reducing bereaved spouses' depression (Maruyama & Atencio, 2008).

Researchers have found that religiosity and coping skills are related to well-being following the loss of a spouse in late adulthood (Leighton, 2008). Further, a recent study revealed that compared with continually married counterparts, adults aged 50 and older who experienced the death of a spouse reported a higher participation in volunteer work several years after the death (Li, 2007). The volunteer work helped to protect the spouses from depressive symptoms, and an increase in volunteer hours enhanced their self-efficacy. Another recent study also found that when older adults helped others following the death of a spouse, they experienced an accelerated decline in depressive symptoms (Brown & others, 2008).

A widow with the urn containing the remains of her husband, who was killed while working in Iraq. *What are some factors that are related to the adjustment of a widow after the death of her husband?*

FORMS OF MOURNING

One decision facing the bereaved is what to do with the body. In the United States, approximately two-thirds of corpses were disposed of by burial in 2006, the remaining one-third by cremation—a significant increase from 15 percent in 1985 (Cremation Association of North America, 2008). Cremation is more popular in the Pacific region of the United States, less popular in the South. Cremation also is more popular in Canada than in the United States and most popular of all in Japan and many other Asian countries.

The funeral is an important aspect of mourning in many cultures. In one study, bereaved individuals who were personally religious derived more psychological benefits from a funeral, participated more actively in the rituals, and adjusted more positively to the loss (Hayslip, Edmondson, & Guarnaccia, 1999). In the United States, the trend is away from public funerals and displaying the dead body in an open casket and toward private funerals followed by a memorial ceremony (Callahan, 2009).

developmental **connection**

Religion. Religious participation is positively linked to health and longevity. Chapter 15, p. 495

A funeral in the United States.

Men carrying a sarcophagus (stone coffin) in the form of a water buffalo bearing a dead body inside during a procession for a cremation ceremony on the Indonesian island of Bali. The cremation is intended to return the bodies to the fundamental elements of fire, water, earth, and void.

The funeral industry has been the source of controversy in recent years. Funeral directors and their supporters argue that the funeral provides a form of closure to the relationship with the deceased, especially when there is an open casket. Their critics claim that funeral directors are just trying to make money and that embalming is grotesque. One way to avoid being exploited during bereavement is to purchase funeral arrangements in advance. However, in one survey only 24 percent of individuals 60 and over had made any funeral arrangements (Kalish & Reynolds, 1976).

In some cultures, a ceremonial meal is held after death; in others, a black armband is worn for one year following a death. Cultures vary in how they practice mourning. Two of those cultures are the Amish and traditional Judaism (Worthington, 1989).

The Amish are a conservative group with approximately 80,000 members in the United States, Ontario, and several small settlements in South and Central America. The Amish live in a family-oriented society in which family and community support are essential for survival. Today, they live at the same unhurried pace as that of their ancestors, using horses instead of cars and facing death with the same steadfast faith as their forebears. At the time of death, close neighbors assume the responsibility of notifying others of the death. The Amish community handles virtually all aspects of the funeral.

The funeral service is held in a barn in warmer months and in a house during colder months. Calm acceptance of death, influenced by a deep religious faith, is an integral part of the Amish culture. Following the funeral, a high level of support is given to the bereaved family for at least a year. Visits to the family, special scrapbooks and handmade items for the family, new work projects started for the widow, and quilting days that combine fellowship and productivity are among the supports given to the bereaved family. A profound example of the Amish culture's religious faith and acceptance of death occurred after Charles Roberts shot and killed five Amish schoolgirls and then apparently took his own life in October 2006 in Bart Township, Pennsylvania. Soon after the murders and suicide, members of the Amish community visited his widow and offered their support and forgiveness.

A funeral procession of horse-drawn buggies on their way to the burial of five young Amish girls who were murdered in October 2006. A remarkable aspect of their mourning involved the outpouring of support and forgiveness they gave to the widow of the murderer.

Meeting in a Jewish graveyard.

The family and community also have specific and important roles in mourning in traditional Judaism. The program of mourning is divided into graduated time periods, each with its appropriate practices. The observance of these practices is required of the spouse and the immediate blood relatives of the deceased. The first period is *aninut,* the period between death and burial. The next two periods make up *avelut,* or mourning proper. The first of these is *shivah,* a period of seven days, which commences with the burial. It is followed by *sheloshim,* the 30-day period following the burial, including shivah. At the end of sheloshim, the mourning process is considered over for all but one's parents. For parents, mourning continues for 11 months, although observances are minimal.

The seven-day period of the shivah is especially important in traditional Judaism. The mourners, sitting together as a group through an extended period, have an opportunity to project their feelings to the group as a whole. Visits from others during shivah may help the mourner deal with feelings of guilt. After shivah, the mourner is encouraged to resume normal social interaction. In fact, it is customary for the mourners to walk together a short distance as a symbol of their return to society. In its entirety, the elaborate mourning system of traditional Judaism is designed to promote personal growth and to reintegrate the individual into the community.

Review *Connect* Reflect

LG5 Identify ways to cope with the death of another person.

Review

- What are some strategies for communicating with a dying person?
- What is the nature of grieving?
- How is making sense of the world a beneficial outcome of grieving?
- What are some characteristics and outcomes of losing a life partner?
- What are some forms of mourning? What is the nature of the funeral?

Connect

- In this section, we learned that one advantage to knowing you are dying is that you have the opportunity to reminisce. Which of Erikson's stages of development involves reflecting on the past and either piecing together a positive review or concluding that one's life has not been well spent?

Reflect *Your Own Personal Journey of Life*

- What are considered appropriate forms of mourning in the culture in which you live?

topical **connections**

We have arrived at the end of this book. I hope this book and course have been a window to the life span of the human species and a window to your own personal journey in life.

Our study of the human life span has been long and complex. You have read about many physical, cognitive, and socioemotional changes that take place from conception through death. This is a good time to reflect on what you have learned. Which theories, studies, and ideas were especially interesting to you? What did you learn about your own development?

I wish you all the best in the remaining years of your journey through the human life span.

John W. Santrock

looking ***forward***

reach your **learning goals**

Death, Dying, and Grieving

1 The Death System and Cultural Contexts

LG1 Describe the death system and its cultural and historical contexts.

The Death System and Its Cultural Variations

- In Kastenbaum's view, every culture has a death system that involves these components: people, places, times, and objects and symbols. Most cultures do not view death as the end of existence—spiritual life is thought to continue. Most societies throughout history have had philosophical or religious beliefs about death, and most societies have rituals that deal with death. The United States has been described as more of a death-denying and death-avoiding culture than most cultures.

Changing Historical Circumstances

- When, where, and why people die have changed historically. Today, death occurs most often among older adults. More than 80 percent of all deaths in the United States now occur in a hospital or other institution; our exposure to death in the family has been minimized.

2 Defining Death and Life/Death Issues

LG2 Evaluate issues in determining death and decisions regarding death.

Issues in Determining Death

- Twenty-five years ago, determining if someone was dead was simpler than it is today. Brain death is a neurological definition of death, which states that a person is brain dead when all electrical activity of the brain has ceased for a specified period of time. Medical experts debate whether this should mean the higher and lower brain functions or just the higher cortical functions. Currently, most physicians define brain death as the death of both the higher cortical functions and the lower brain stem functions.

Decisions Regarding Life, Death, and Health Care

- Decisions regarding life, death, and health care can involve whether to have a living will, the issue of euthanasia, and the availability of hospice care. Living wills and advance directives are increasingly used. Euthanasia ("mercy killing") is the act of painlessly ending the life of a person who is suffering from an incurable disease or disability. Distinctions are made between active and passive euthanasia. Hospice care emphasizes reducing pain and suffering rather than prolonging life.

3 A Developmental Perspective on Death

LG3 Discuss death and attitudes about it at different points in development.

Causes of Death

- Although death is more likely to occur in late adulthood, death can come at any point in development. In children and younger adults, death is more likely to occur because of accidents or illness; in older adults, death is more likely to occur because of chronic diseases such as heart disease or cancer.

Attitudes Toward Death at Different Points in the Life Span

- Infants do not have a concept of death. Preschool children also have little concept of death. Preschool children sometimes blame themselves for a person's death. In the elementary school years, children develop a more realistic orientation toward death. Most psychologists argue that honesty is the best strategy for helping children cope with death. Death may be glossed over in adolescence. Adolescents have more abstract, philosophical views of death than children do. Recent research indicates that rather than perceiving themselves as invulnerable many adolescents perceive that they will experience an early death. There is no evidence that a special orientation toward death emerges in early adulthood. Middle adulthood is a time when adults show a heightened consciousness about death and death anxiety. Older adults often show less death anxiety than middle-aged adults, but older adults experience and converse about death more. Attitudes about death may vary considerably among adults of any age.

4 Facing One's Own Death

LG4 Explain the psychological aspects involved in facing one's own death and the contexts in which people die.

Kübler-Ross' Stages of Dying

- Kübler-Ross proposed five stages: denial and isolation, anger, bargaining, depression, and acceptance. Not all individuals go through the same sequence.

Perceived Control and Denial

- Perceived control and denial may work together as an adaptive orientation for the dying individual. Denial can be adaptive or maladaptive, depending on the circumstance.

The Contexts in Which People Die

- That most deaths in the United States occur in hospitals has advantages and disadvantages. Most individuals say they would rather die at home, but they worry that they will be a burden and they worry about the lack of medical care.

5 Coping With the Death of Someone Else

LG5 Identify ways to cope with the death of another person.

Communicating With a Dying Person

- Most psychologists recommend an open communication system with the dying. Communication should not dwell on mental pathology or preparation for death but should emphasize the dying person's strengths.

Grieving

- Grief is the emotional numbness, disbelief, separation anxiety, despair, sadness, and loneliness that accompany the loss of someone we love. Grief is multidimensional and in some cases may last for years. Prolonged grief involves enduring despair and is still unresolved after an extended period of time. In the dual-process model of coping with bereavement, oscillation occurs between two dimensions: (1) loss-oriented stressors, and (2) restoration-oriented stressors. Grief and coping vary with the type of death. There are cultural variations in grieving.

Making Sense of the World

- The grieving process may stimulate individuals to strive to make sense out of their world. When a death is caused by an accident or disaster, the effort to make sense of it is pursued more vigorously.

Losing a Life Partner

- The death of an intimate partner often leads to profound grief. The bereaved are at risk for many health problems, although there are variations in the distress experienced by a surviving spouse. Social support benefits widows and widowers.

Forms of Mourning

- Forms of mourning vary across cultures. Approximately two-thirds of corpses are disposed of by burial, one-third by cremation. An important aspect of mourning in many cultures is the funeral. In recent years, the funeral industry has been the focus of controversy. In some cultures, a ceremonial meal is held after death.

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glossary

A

acceptance Kübler-Ross' fifth stage of dying, in which the dying person develops a sense of peace, an acceptance of her or his fate, and, in many cases, a desire to be left alone.

accommodation Piagetian concept of adjusting schemes to fit new information and experiences.

active euthanasia Death induced deliberately, as by injecting a lethal dose of a drug.

active (niche-picking) genotype-environment correlations Correlations that exist when children seek out environments they find compatible and stimulating.

activity theory The theory that the more active and involved older adults are, the more likely they are to be satisfied with their lives.

addiction A pattern of behavior characterized by an overwhelming involvement with using a drug and securing its supply.

adolescent egocentrism The heightened self-consciousness of adolescents.

adoption study A study in which investigators seek to discover whether, in behavior and psychological characteristics, adopted children are more like their adoptive parents, who provided a home environment, or more like their biological parents, who contributed their heredity. Another form of the adoption study is to compare adoptive and biological siblings.

aerobic exercise Sustained exercise (such as jogging, swimming, or cycling) that stimulates heart and lung activity.

affectionate love In this type of love, also called companionate love, an individual desires to have the other person near and has a deep, caring affection for the other person.

affordances Opportunities for interaction offered by objects that fit within our capabilities to perform functional activities.

afterbirth The third stage of birth, when the placenta, umbilical cord, and other membranes are detached and expelled.

ageism Prejudice against others because of their age, especially prejudice against older adults.

Alzheimer disease A progressive, irreversible brain disorder characterized by a gradual deterioration of memory, reasoning, language, and eventually physical function.

amnion The life-support system that is a bag or envelope that contains a clear fluid in which the developing embryo floats.

amygdala The region of the brain that is the seat of emotions.

androgyny The presence of positive masculine and feminine characteristics in the same individual.

anger Kübler-Ross' second stage of dying, in which the dying person's denial gives way to anger, resentment, rage, and envy.

anger cry A variation of the basic cry, with more excess air forced through the vocal cords.

animism The belief that inanimate objects have life-like qualities and are capable of action.

anorexia nervosa An eating disorder that involves the relentless pursuit of thinness through starvation.

A-not-B error Error that occurs when infants make the mistake of selecting the familiar hiding place (A) rather than the new hiding place (B) as they progress into substage 4 in Piaget's sensorimotor stage; also called AB error.

anxious attachment style An attachment style that describes adults who demand closeness, are less trusting, and are more emotional, jealous, and possessive.

Apgar Scale A widely used method to assess the health of newborns at one and five minutes after birth. The Apgar Scale evaluates an infant's heart rate, respiratory effort, muscle tone, body color, and reflex irritability.

aphasia A loss or impairment of language ability caused by brain damage.

arthritis Inflammation of the joints that is accompanied by pain, stiffness, and movement problems; especially common in older adults.

Asperger syndrome A relatively mild autism spectrum disorder in which the child has relatively good verbal language, milder nonverbal language problems, and a restricted range of interests and relationships.

assimilation Piagetian concept of using existing schemes to deal with new information or experiences.

attachment A close emotional bond between two people.

attention The focusing of mental resources on select information.

attention deficit hyperactivity disorder (ADHD) A disability in which children consistently show one or more of the following characteristics: (1) inattention, (2) hyperactivity, and (3) impulsivity.

authoritarian parenting A restrictive, punitive style in which parents exhort the child to follow their directions and to respect their work and effort. The authoritarian parent places firm limits and controls on the child and allows little verbal exchange. Authoritarian parenting is associated with children's social incompetence.

authoritative parenting A parenting style in which parents encourage their children to be independent but still place limits and controls on their actions. Extensive verbal give-and-take is allowed, and parents are warm and nurturant toward the child. Authoritative parenting is associated with children's social competence.

autism spectrum disorders (ASD) Also called pervasive developmental disorders, they range from the severe disorder labeled autistic disorder to the milder disorder called Asperger syndrome. Children with these disorders are characterized by problems in social interaction, verbal and nonverbal communication, and repetitive behaviors.

autistic disorder A severe autism spectrum disorder that has its onset in the first three years of life and includes deficiencies in social relationships, abnormalities in communication, and restricted, repetitive, and stereotyped patterns of behavior.

autonomous morality In Piaget's theory, displayed by older children (about 10 years of age and older). The child becomes aware that rules and laws are created by people and that in judging an action one should consider the actor's intentions as well as the consequences.

average children Children who receive an average number of both positive and negative nominations from peers.

avoidant attachment style An attachment style that describes adults who are hesitant about getting involved in romantic relationships and once in a relationship tend to distance themselves from their partner.

B

bargaining Kübler-Ross' third stage of dying, in which the dying person develops the hope that death can somehow be postponed.

basic cry A rhythmic pattern usually consisting of a cry, a briefer silence, a shorter inspiratory whistle that is higher pitched than the main cry, and then a brief rest before the next cry.

Bayley Scales of Infant Development Scales developed by Nancy Bayley that are widely used in the assessment of infant development. The current version has three components: a mental scale, a motor scale, and an infant behavior profile.

behavior genetics The field that seeks to discover the influence of heredity and environment on individuals differences in human traits and development.

Big Five factors of personality Emotional stability (neuroticism), extraversion, openness to experience, agreeableness, and conscientiousness.

biological processes Changes in an individual's physical nature.

blastocyst The inner layer of cells that develops during the germinal period. These cells later develop into the embryo.

bonding The formation of a close connection, especially a physical bond, between parents and their newborn in the period shortly after birth.

brain death A neurological definition of death. A person is brain dead when all electrical activity of the brain has ceased for a specified period of time. A flat EEG recording is one criterion of brain death.

brainstorming A technique in which individuals are encouraged to come up with creative ideas in a group, play off each other's ideas, and say practically whatever comes to mind.

Brazelton Neonatal Behavioral Assessment Scale (NBAS) A measure that is used in the first month of life to assess the newborn's neurological development, reflexes, and reactions to people and objects.

breech position The baby's position in the uterus that causes the buttocks to be the first part to emerge from the vagina.

Broca's area An area in the brain's left frontal lobe that is involved in speech production.

Bronfenbrenner's ecological theory Bronfenbrenner's environmental systems theory that focuses on five environmental systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

bulimia nervosa An eating disorder in which the individual consistently follows a binge-and-purge pattern.

C

care perspective The moral perspective of Carol Gilligan, which views people in terms of their connectedness with others and emphasizes interpersonal communication, relationships with others, and concern for others.

case study An in-depth look at a single individual.

cataracts A thickening of the lens of the eye that causes vision to become cloudy, opaque, and distorted.

cellular clock theory Leonard Hayflick's theory that the maximum number of times that human cells can divide is about 75 to 80. As we age, our cells have less capability to divide.

centration The focusing of attention on one characteristic to the exclusion of all others.

cephalocaudal pattern The sequence in which the earliest growth always occurs at the top—the head—with physical growth in size, weight, and feature differentiation gradually working from top to bottom.

cesarean delivery The baby is removed from the mother's uterus through an incision made in her abdomen.

child-centered kindergarten Education that involves the whole child by considering both the child's physical, cognitive, and socioemotional development and the child's needs, interests, and learning styles.

child-directed speech Language spoken in a higher pitch than normal with simple words and sentences.

chromosomes Threadlike structures that come in 23 pairs, one member of each pair coming from each parent. Chromosomes contain the genetic substance DNA.

chronic disorders Disorders that are characterized by slow onset and long duration. They are rare in early adulthood, they increase during middle adulthood, and they become common in late adulthood.

climacteric The midlife transition in which fertility declines.

clique A small group that ranges from 2 to about 12 individuals, averaging about 5 to 6 individuals, and can form because adolescents engage in similar activities.

cognitive mechanics The "hardware" of the mind, reflecting the neurophysiological architecture of the brain. Cognitive mechanics involve the speed and accuracy of the processes involving sensory input, visual and motor memory, discrimination, comparison, and categorization.

cognitive pragmatics The culture-based "software programs" of the mind. Cognitive pragmatics include reading and writing skills, language comprehension, educational qualifications, professional skills, and also the type of knowledge about the self and life skills that help us to master or cope with life.

cognitive processes Changes in an individual's thought, intelligence, and language.

cohort effects Effects due to a person's time of birth, era, or generation but not to actual age.

commitment Marcia's term for the part of identity development in which adolescents show a personal investment in identity.

conscience An internal regulation of standards of right and wrong that involves an integration of moral thought, feeling, and behavior.

consensual validation An explanation of why individuals are attracted to people who are similar to them. Our own attitudes and behavior are supported and validated when someone else's attitudes and behavior are similar to our own.

conservation In Piaget's theory, awareness that altering an object's or a substance's appearance does not change its basic properties.

constructive play Play that combines sensorimotor and repetitive activity with symbolic representation of ideas. Constructive play occurs when children engage in self-regulated creation or construction of a product or a solution.

constructivist approach A learner-centered approach that emphasizes the importance of individuals actively constructing their knowledge and understanding with guidance from the teacher.

contemporary life-events approach Approach emphasizing that how a life event influences the individual's development depends not only on the life event, but also on mediating factors, the individual's adaptation to the life event, the life-stage context, and the sociohistorical context.

continuity-discontinuity issue Focuses on the extent to which development involves gradual, cumulative change (continuity) or distinct stages (discontinuity).

controversial children Children who are frequently nominated both as a best friend and as being disliked.

conventional reasoning The second, or intermediate, level in Kohlberg's theory of moral development. At this level, individuals abide by certain standards but they are the standards of others such as parents or the laws of society.

convergent thinking Thinking that produces one correct answer and is characteristic of the kind of thinking tested by standardized intelligence tests.

convoy model of social relations Model in which individuals go through life embedded in a personal network of individuals to whom they give and from whom they receive support.

coordination of secondary circular reactions Piaget's fourth sensorimotor substage, which develops between 8 and 12 months of age. Actions become more outwardly directed, and infants coordinate schemes and act with intentionality.

core knowledge approach States that infants are born with domain-specific innate knowledge systems.

corpus callosum The location where fibers connect the brain's left and right hemispheres.

correlation coefficient A number based on statistical analysis that is used to describe the degree of association between two variables.

correlational research The goal is to describe the strength of the relationship between two or more events or characteristics.

creative thinking The ability to think in novel and unusual ways and to come up with unique solutions to problems.

crisis Marcia's term for a period of identity development during which the adolescent is exploring alternatives.

critical thinking Thinking reflectively and productively, as well as evaluating the evidence.

cross-cultural studies Comparison of one culture with one or more other cultures. These provide information about the degree to which development is similar, or universal, across cultures, and the degree to which it is culture-specific.

cross-sectional approach A research strategy in which individuals of different ages are compared at one time.

crowd A crowd is a larger group structure than a clique and is usually formed based on reputation; members may or may not spend much time together.

crystallized intelligence Accumulated information and verbal skills, which increase in middle adulthood, according to Horn.

cultural-familial retardation Retardation that is characterized by no evidence of organic brain damage, but the individual's IQ is generally between 50 and 70.

culture The behavior patterns, beliefs, and all other products of a group that are passed on from generation to generation.

culture-fair tests Tests of intelligence that are designed to be free of cultural bias.

D

date or acquaintance rape Coercive sexual activity directed at someone with whom the perpetrator is at least casually acquainted.

deferred imitation Imitation that occurs after a delay of hours or days.

dementia A global term for any neurological disorder in which the primary symptoms involve a deterioration of mental functioning.

denial and isolation Kübler-Ross' first stage of dying, in which the dying person denies that she or he is really going to die.

depression Kübler-Ross' fourth stage of dying, in which the dying person comes to accept the certainty of her or his death. A period of depression or preparatory grief may appear.

descriptive research Has the purpose of observing and recording behavior.

development The pattern of change that begins at conception and continues through the life span. Most development involves growth, although it also includes decline brought on by aging and dying.

developmental quotient (DQ) An overall score that combines subscores in motor, language, adaptive, and personal-social domains in the Gesell assessment of infants.

developmentally appropriate practice Education that focuses on the typical developmental patterns of children (age-appropriateness) and the uniqueness of each child (individual-appropriateness).

difficult child A child who tends to react negatively and cry frequently, engages in irregular daily routines, and is slow to accept change.

direct instruction approach A structured, teacher-centered approach that is characterized by teacher direction and control, mastery of academic skills, high expectations for students' progress, maximum time spent on learning tasks, and efforts to keep negative effect to a minimum.

dishabituation Recovery of a habituated response after a change in stimulation.

divergent thinking Thinking that produces many answers to the same question and is characteristic of creativity.

divided attention Concentrating on more than one activity at the same time.

DNA A complex molecule that contains genetic information.

doula A caregiver who provides continuous physical, emotional, and educational support for the mother before, during, and after childbirth.

Down syndrome A chromosomally transmitted form of mental retardation, caused by the presence of an extra copy of chromosome 21.

dual-process model A model of coping with bereavement that emphasizes oscillation between two dimensions: (1) loss-oriented stressors, and (2) restoration-oriented stressors.

dual-process model States that decision making is influenced by two systems—one analytical and one experiential, which compete with each other; in this model, it is the experiential system—monitoring and managing actual experiences—that benefits adolescent decision making.

dynamic systems theory The perspective on motor development that seeks to explain how motor behaviors are assembled for perceiving and acting.

dyscalculia Also known as developmental arithmetic disorder; a learning disability that involves difficulty in math computation.

dysgraphia A learning disability that involves difficulty in handwriting.

dyslexia A category of learning disabilities involving a severe impairment in the ability to read and spell.

E

easy child A child who is generally in a positive mood, quickly establishes regular routines in infancy, and adapts easily to new experiences.

eclectic theoretical orientation An orientation that does not follow any one theoretical approach, but rather selects from each theory whatever is considered the best in it.

ecological view The view that perception functions to bring organisms in contact with the environment and to increase adaptation.

egocentrism The inability to distinguish between one's own perspective and someone else's (salient feature of the first substage of preoperational thought).

eldercare Physical and emotional caretaking for older members of the family, whether by giving day-to-day physical assistance or by being responsible for overseeing such care.

embryonic period The period of prenatal development that occurs two to eight weeks after conception. During the embryonic period, the rate of cell differentiation intensifies, support systems for the cells form, and organs appear.

emerging adulthood The transition from adolescence to adulthood (approximately 18 to 25 years of age) that involves experimentation and exploration.

emotion Feeling, or affect, that occurs when a person is in a state or interaction that is important to him or her. Emotion is characterized by behavior that reflects (expresses) the pleasantness or unpleasantness of the state a person is in or the transactions being experienced.

emotional and behavioral disorders Serious, persistent problems that involve relationships, aggression, depression, fears associated with personal or school matters, as well as other inappropriate socioemotional characteristics.

empty nest syndrome A decrease in marital satisfaction after children leave home, because parents derive considerable satisfaction from their children.

epigenetic view Emphasizes that development is the result of an ongoing, bidirectional interchange between heredity and environment.

episodic memory The retention of information about the where and when of life's happenings.

equilibration A mechanism that Piaget proposed to explain how children shift from one stage of thought to the next.

erectile dysfunction The inability to adequately achieve and maintain an erection that results in satisfactory sexual performance.

Erikson's theory Includes eight stages of human development. Each stage consists of a unique developmental task that confronts individuals with a crisis that must be resolved.

ethnic gloss Using an ethnic label such as African American or Latino in a superficial way that portrays an ethnic group as being more homogeneous than it really is.

ethnic identity An enduring, basic aspect of the self that includes a sense of membership in an ethnic group and the attitudes and feelings related to that membership.

ethnicity A characteristic based on cultural heritage, nationality characteristics, race, religion, and language.

ethology Stresses that behavior is strongly influenced by biology, is tied to evolution, and is characterized by critical or sensitive periods.

euthanasia The act of painlessly ending the lives of persons who are suffering from incurable diseases or severe disabilities; sometimes called "mercy killing."

evocative genotype-environment correlations Correlations that exist when the child's genotype elicits certain types of physical and social environments.

evolutionary psychology Emphasizes the importance of adaptation, reproduction, and "survival of the fittest" in shaping behavior.

evolutionary theory of aging This theory states that natural selection has not eliminated many harmful conditions and nonadaptive characteristics in older adults; thus, the benefits conferred by evolutionary theory decline with age because natural selection is linked to reproductive fitness.

executive attention Involves action planning, allocating attention to goals, error detection and compensation, monitoring progress on tasks, and dealing with novel or difficult circumstances.

experiment A carefully regulated procedure in which one or more of the factors believed to influence the behavior being studied are manipulated while all other factors are held constant.

explicit memory Memory of facts and experiences that individuals consciously know and can state.

F

fertilization A stage in reproduction whereby an egg and a sperm fuse to create a single cell, called a zygote.

fetal alcohol spectrum disorders (FASD) A cluster of abnormalities that appears in the offspring of mothers who drink alcohol heavily during pregnancy.

fetal period Lasting about seven months, the prenatal period between two months after conception and birth in typical pregnancies.

fine motor skills Motor skills that involve more finely tuned movements, such as finger dexterity.

first habits and primary circular reactions Piaget's second sensorimotor substage, which develops between 1 and 4 months of age. In this substage, the infant coordinates sensation and two types of schemes: habits and primary circular reactions.

fluid intelligence The ability to reason abstractly, which begins to decline from middle adulthood on, according to Horn.

fragile X syndrome A genetic disorder involving an abnormality in the X chromosome, which becomes constricted and often breaks.

free-radical theory A microbiological theory of aging that states that people age because inside their cells normal metabolism produces unstable oxygen molecules known as free radicals. These molecules ricochet around inside cells, damaging DNA and other cellular structures.

fuzzy trace theory States that memory is best understood by considering two types of memory representations: (1) verbatim memory trace, and (2) gist. In this theory, older children's better memory is attributed to the fuzzy traces created by extracting the gist of information.

G

games Activities engaged in for pleasure that include rules and often competition with one or more individuals.

gender The characteristics of people as males or females.

gender identity The sense of being male or female, which most children acquire by the time they are 3 years old.

gender role A set of expectations that prescribes how females or males should think, act, and feel.

gender schema theory The theory that gender-typing emerges as children develop gender schemas of their culture's gender-appropriate and gender-inappropriate behavior.

gender stereotypes Broad categories that reflect our impressions and beliefs about females and males.

gender typing Acquisition of a traditional masculine or feminine role.

gene × environment (G × E) interaction The interaction of a specific measured variation in the DNA and a specific measured aspect of the environment.

generational inequity The view that our aging society is being unfair to its younger members because older adults pile up advantages by receiving inequitably large allocations of resources.

genes Units of hereditary information composed of DNA. Genes direct cells to reproduce themselves and manufacture the proteins that maintain life.

genotype A person's genetic heritage; the actual genetic material.

germinal period The period of prenatal development that takes place in the first two weeks after conception. It includes the creation of the zygote, continued cell division, and the attachment of the zygote to the uterine wall.

gifted Having above-average intelligence (an IQ of 130 or higher) and/or superior talent for something.

glaucoma Damage to the optic nerve because of the pressure created by a buildup of fluid in the eye.

goodness of fit Refers to the match between a child's temperament and the environmental demands with which the child must cope.

grasping reflex A neonatal reflex that occurs when something touches the infant's palms. The infant responds by grasping tightly.

grief The emotional numbness, disbelief, separation anxiety, despair, sadness, and loneliness that accompany the loss of someone we love.

gross motor skills Motor skills that involve large-muscle activities, such as walking.

H

habituation Decreased responsiveness to a stimulus after repeated presentations of the stimulus.

heteronomous morality Kohlberg's first stage of preconventional reasoning in which moral thinking is tied to punishment.

heteronomous morality The first stage of moral development in Piaget's theory, occurring from approximately 4 to 7 years of age. Justice and rules are conceived of as unchangeable properties of the world, removed from the control of people.

hormonal stress theory The theory that aging in the body's hormonal system can lower resistance to stress and increase the likelihood of disease.

hormones Powerful chemical substances secreted by the endocrine glands and carried through the body by the bloodstream.

hospice A program committed to making the end of life as free from pain, anxiety, and depression as possible. The goals of hospice contrast with those of a hospital, which are to cure disease and prolong life.

hypotheses Specific assumptions and predictions that can be tested to determine their accuracy.

hypothetical-deductive reasoning Piaget's formal operational concept that adolescents have the cognitive ability to develop hypotheses, or best guesses, about ways to solve problems, such as an algebraic equation.

I

identity achievement Marcia's term for the status of individuals who have undergone a crisis and have made a commitment.

identity diffusion Marcia's term for the status of individuals who have not yet experienced a crisis (explored meaningful alternatives) or made any commitments.

identity foreclosure Marcia's term for the status of individuals who have made a commitment but have not experienced a crisis.

identity moratorium Marcia's term for the status of individuals who are in the midst of a crisis, but their commitments are either absent or vaguely defined.

imaginary audience Involves adolescents' belief that others are as interested in them as they themselves are, as well as attention-getting behavior motivated by a desire to be noticed, visible, and "on stage."

immanent justice The concept that if a rule is broken punishment will be meted out immediately.

implicit memory Memory without conscious recollection; involves skills and routine procedures that are automatically performed.

inclusion Educating a child with special education needs full-time in the regular classroom.

individual differences The stable, consistent ways in which people are different from each other.

individualism, instrumental purpose, and exchange Kohlberg's second stage of preconventional reasoning. At this stage, individuals pursue their own interests but also let others do the same.

individualized education plan (IEP) A written statement that spells out a program specifically tailored to a child with a disability.

indulgent parenting A style of parenting in which parents are highly involved with their children but place few demands or controls on them. Indulgent parenting is associated with children's social incompetence, especially a lack of self-control.

infinite generativity The ability to produce an endless number of meaningful sentences using a finite set of words and rules.

information-processing theory Emphasizes that individuals manipulate information, monitor it, and strategize about it. Central to this theory are the processes of memory and thinking.

insecure avoidant babies Babies that show insecurity by avoiding the caregiver.

insecure disorganized babies Babies that show insecurity by being disorganized and disoriented.

insecure resistant babies Babies that often cling to the caregiver, then resist the caregiver by fighting against the closeness, perhaps by kicking or pushing away.

integrity versus despair Erikson's eighth and final stage of development, which individuals experience in late adulthood. This involves reflecting on the past and either piecing together a positive review or concluding that one's life has not been well spent.

intelligence Problem-solving skills and the ability to learn from and adapt to the experiences of everyday life.

intelligence quotient (IQ) A person's mental age divided by chronological age, multiplied by 100.

intermodal perception The ability to relate and integrate information from two or more sensory modalities, such as vision and hearing.

internalization of schemes Piaget's sixth and final sensorimotor substage, which develops between 18 and 24 months of age. In this substage, the infant develops the ability to use primitive symbols.

intimacy in friendships Self-disclosure and the sharing of private thoughts.

intuitive thought substage Piaget's second substage of preoperational thought, in which children begin to use primitive reasoning and want to know the answers to all sorts of questions (between 4 and 7 years of age).

J

joint attention Process that occurs when individuals focus on the same object and an ability to track another's behavior is present, one individual directs another's attention, and reciprocal interaction is present.

justice perspective A moral perspective that focuses on the rights of the individual; individuals independently make moral decisions.

juvenile delinquent An adolescent who breaks the law or engages in behavior that is considered illegal.

K

kangaroo care Treatment for preterm infants that involves skin-to-skin contact.

Klinefelter syndrome A chromosomal disorder in which males have an extra X chromosome, making them XXY instead of XY.

kwashiorkor A condition caused by severe protein deficiency in which the child's abdomen and feet become swollen with water; usually appears between 1 to 3 years of age.

L

laboratory A controlled setting in which many of the complex factors of the "real world" are removed.

language A form of communication, whether spoken, written, or signed, that is based on a system of symbols. Language consists of the words used by a community and the rules for varying and combining them.

language acquisition device (LAD) Chomsky's term that describes a biological endowment enabling the child to detect the features and rules of language, including phonology, syntax, and semantics

lateralization Specialization of function in one hemisphere of the cerebral cortex or the other.

learning disability Describes a child who has difficulty in learning that involves understanding or using spoken or written language, and the difficulty can appear in listening, thinking, reading, writing, and spelling.A learning disability also may involve difficulty in doing mathematics. To be classified as a learning disability, the learning problem is not primarily the result of visual, hearing, or motor disabilities; mental retardation; emotional disorders; or due to environmental, cultural, or economic disadvantage.

least restrictive environment (LRE) A setting that is as similar as possible to the one in which children who do not have a disability are educated.

leisure The pleasant times after work when individuals are free to pursue activities and interests of their own choosing.

life expectancy The number of years that will probably be lived by the average person born in a particular year.

life span The upper boundary of life, the maximum number of years an individual can live. The maximum life span of human beings is about 120 to 125 years of age.

life-span perspective The perspective that development is lifelong, multidimensional, multidirectional, plastic, multidisciplinary, and contextual; involves growth, maintenance, and regulation; and is constructed through biological, sociocultural, and individual factors working together.

longitudinal approach A research strategy in which the same individuals are studied over a period of time, usually several years or more.

long-term memory A relatively permanent type of memory that holds huge amounts of information for a long period of time.

low birth weight infants An infant that weighs less than 5½ pounds at birth.

M

macular degeneration A disease that involves deterioration of the macula of the retina, which corresponds to the focal center of the visual field.

major depression A mood disorder in which the individual is deeply unhappy, demoralized, self-derogatory, and bored. The person does not feel well, loses stamina easily, has poor appetite, and is listless and unmotivated. Major depression is so widespread that it has been called the “common cold” of mental disorders.

marasmus A wasting away of body tissues in the infant’s first year, caused by severe protein-calorie deficiency.

matching hypothesis States that although we prefer a more attractive person in the abstract, in the real world we end up choosing someone who is close to our own level.

meaning-making coping Involves drawing on beliefs, values, and goals to change the meaning of a stressful situation, especially in times of chronic stress as when a loved one dies.

meiosis A specialized form of cell division that occurs to form eggs and sperm (or gametes).

memory A central feature of cognitive development, pertaining to all situations in which an individual retains information over time.

menarche A girl’s first menstruation.

menopause Cessation of a woman’s menstrual periods, usually in the late forties or fifties.

mental age (MA) Binet’s measure of an individual’s level of mental development, compared with that of others.

mental retardation A condition of limited mental ability in which an individual has a low IQ, usually below 70 on a traditional test of intelligence, and has difficulty adapting to everyday life.

metacognition Cognition about cognition, or knowing about knowing.

metalinguistic awareness Refers to knowledge about language, such as knowing what a preposition is or the ability to discuss the sounds of a language.

middle adulthood The developmental period that begins at approximately 40 to 45 years of age and extends to about 60 to 65 years of age.

mindfulness Being alert, mentally present, and cognitively flexible while going through life’s everyday activities and tasks.

mindset The cognitive view, either fixed or growth, that individuals develop for themselves.

mitochondrial theory The theory that aging is caused by the decay of mitochondria, tiny cellular bodies that supply energy for function, growth, and repair.

mitosis Cellular reproduction in which the cell’s nucleus duplicates itself with two new cells being formed, each containing the same DNA as the parent cell, arranged in the same 23 pairs of chromosomes.

Montessori approach An educational philosophy in which children are given considerable freedom and spontaneity in choosing activities and are allowed to move from one activity to another as they desire.

moral development Development that involves thoughts, feelings, and behaviors regarding rules and conventions about what people should do in their interactions with other people.

Moro reflex A neonatal startle response that occurs in reaction to a sudden, intense noise or movement. When startled, the newborn arches its back, throws its head back, and flings out its arms and legs. Then the newborn rapidly closes its arms and legs to the center of the body.

morphology Units of meaning involved in word formation.

multi-infarct dementia Sporadic and progressive loss of intellectual functioning caused by repeated temporary obstruction of blood flow in cerebral arteries.

mutual interpersonal expectations, relationships, and interpersonal conformity Kohlberg’s third stage of moral development. At this stage, individuals value trust, caring, and loyalty to others as a basis of moral judgments.

myelination The process by which the nerve cells are covered and insulated with a layer of fat cells, which increases the speed at which information travels through the nervous system.

N

narcissism A self-centered and self-concerned approach toward others.

natural childbirth This method attempts to reduce the mother’s pain by decreasing her fear through education about childbirth and relaxation techniques during delivery.

naturalistic observation Observing behavior in real-world settings.

nature-nurture issue Refers to the debate about whether development is primarily influenced by nature or nurture. Nature refers to an organism’s biological inheritance, nurture to its environmental experiences. The “nature proponents” claim biological inheritance is the most important influence on development; the “nurture proponents” claim that environmental experiences are the most important.

neglected children Children who are infrequently nominated as a best friend but are not disliked by their peers.

neglectful parenting A style of parenting in which the parent is very uninvolved in the child’s life; it is associated with children’s social incompetence, especially a lack of self-control.

Neonatal Intensive Care Unit Neurobehavioral Scale (NNNS) An “offspring” of the NBAS, the NNNS provides an assessment of the newborn’s behavior, neurological and stress responses, and regulatory capacities.

neo-Piagetians Developmentalists who argue that Piaget got some things right but that his theory needs considerable revision. They have elaborated on Piaget's theory, giving more emphasis to information processing, strategies, and precise cognitive steps.

neurogenesis The generation of new neurons.

neurons Nerve cells, which handle information processing at the cellular level in the brain.

nonnormative life events Unusual occurrences that have a major impact on an individual's life.

nonshared environmental experiences The child's own unique experiences, both within the family and outside the family, that are not shared by another sibling. Thus, experiences occurring within the family can be part of the "nonshared environment."

normal distribution A symmetrical distribution with most scores falling in the middle of the possible range of scores and a few scores appearing toward the extremes of the range.

normative age-graded influences These are influences that are similar for individuals in a particular age group.

normative history-graded influences Influences that are common to people of a particular generation because of historical circumstances.

O

object permanence The Piagetian term for understanding that objects and events continue to exist, even when they cannot directly be seen, heard, or touched.

operations In Piaget's theory, these are reversible mental actions that allow children to do mentally what they formerly did physically.

organic retardation Mental retardation that is caused by a genetic disorder or brain damage.

organization Piaget's concept of grouping isolated behaviors and thoughts into a higher-order, more smoothly functioning cognitive system.

organogenesis Organ formation that takes place during the first two months of prenatal development.

osteoporosis A chronic condition that involves an extensive loss of bone tissue and is the main reason many older adults walk with a marked stoop. Women are especially vulnerable to osteoporosis.

P

pain cry A sudden appearance of a long, initial loud cry without preliminary moaning, followed by breath holding.

palliative care Care emphasized in a hospice, which involves reducing pain and suffering and helping individuals die with dignity.

Parkinson disease A chronic, progressive disease characterized by muscle tremors, slowing of movement, and partial facial paralysis.

passive euthanasia The withholding of available treatments, such as life-sustaining devices, allowing the person to die.

passive genotype-environment correlations Correlations that exist when the natural parents, who are genetically related to the child, provide a rearing environment for the child.

perception The interpretation of what is sensed.

personal fable The part of adolescent egocentrism that involves an adolescent's sense of uniqueness and invincibility (or invulnerability).

perspective taking The ability to assume other people's perspectives and understand their thoughts and feelings.

phenotype The way an individual's genotype is expressed in observed and measurable characteristics.

phenylketonuria (PKU) A genetic disorder in which an individual cannot properly metabolize an amino acid. PKU is now easily detected but, if left untreated, results in mental retardation and hyperactivity.

phonics approach The idea that reading instruction should teach the basic rules for translating written symbols into sounds.

phonology The sound system of the language, including the sounds that are used and how they may be combined.

Piaget's theory States that children actively construct their understanding of the world and go through four stages of cognitive development.

placenta A life-support system that consists of a disk-shaped group of tissues in which small blood vessels from the mother and offspring intertwine.

popular children Children who are frequently nominated as a best friend and are rarely disliked by their peers.

possible selves What individuals might become, what they would like to become, and what they are afraid of becoming.

postconventional reasoning The highest level in Kohlberg's theory of moral development. At this level, the individual recognizes alternative moral courses, explores the options, and then decides on a personal moral code.

postformal thought A form of thought that is qualitatively different from Piaget's formal operational thought. It involves understanding that the correct answer to a problem can require reflective thinking, that the correct answer can vary from one situation to another, and that the search for truth is often an ongoing, never-ending process. It also involves the belief that solutions to problems need to be realistic and that emotion and subjective factors can influence thinking.

postpartum depression Characteristic of women who have such strong feelings of sadness, anxiety, or despair that they have trouble coping with daily tasks in the postpartum period.

postpartum period The period after childbirth when the mother adjusts, both physically and psychologically, to the process of childbirth. This period lasts for about six weeks or until her body has completed its adjustment and returned to a near prepregnant state.

practice play Play that involves repetition of behavior when new skills are being learned or when physical or mental mastery and coordination of skills are required for games or sports.

pragmatics The appropriate use of language in different contexts.

precocious puberty The very early onset and rapid progression of puberty.

preconventional reasoning The lowest level in Kohlberg's theory of moral development. The individual's moral reasoning is controlled primarily by external rewards and punishment.

preoperational stage Piaget's second stage, lasting from about 2 to 7 years of age, during which children begin to represent the world with words, images, and drawings, and symbolic thought goes beyond simple connections of sensory information and physical action; stable concepts are formed, mental reasoning emerges, egocentrism is present, and magical beliefs are constructed.

prepared childbirth Developed by French obstetrician Ferdinand Lamaze, this childbirth strategy is similar to natural childbirth but includes a special breathing technique to control pushing in the final stages of labor and a more detailed anatomy and physiology course.

pretense/symbolic play Play in which the child transforms the physical environment into a symbol.

preterm infants Those born before the completion of 37 weeks of gestation (the time between fertilization and birth).

primary circular reaction A scheme based on the attempt to reproduce an event that initially occurred by chance.

primary emotions Emotions that are present in humans and other animals and emerge early in life; examples are joy, anger, sadness, fear, and disgust.

Project Head Start A government-funded program that is designed to provide children from low-income families with the opportunity to acquire the skills and experiences important for school success.

prolonged grief Grief that involves enduring despair and is still unresolved over an extended period of time.

prospective memory Remembering to do something in the future.

proximodistal pattern The sequence in which growth starts at the center of the body and moves toward the extremities.

psychoanalytic theories Describe development as primarily unconscious and heavily colored by emotion. Behavior is merely a surface characteristic, and the symbolic workings of the mind have to be analyzed to understand behavior. Early experiences with parents are emphasized.

psychoanalytic theory of gender A theory deriving from Freud's view that the preschool child develops a sexual attraction to the opposite-sex parent, by approximately 5 or 6 years of age renounces this attraction because of anxious feelings, and subsequently identifies with the same-sex parent, unconsciously adopting the same-sex parent's characteristics.

puberty A period of rapid physical maturation, occurring primarily in early adolescence, that involves hormonal and bodily changes.

R

rape Forcible sexual intercourse with a person who does not consent to it.

rapport talk The language of conversation; it is a way of establishing connections and negotiating relationships.

reciprocal socialization Socialization that is bidirectional; children socialize parents, just as parents socialize children.

reflexes Built-in reactions to stimuli that govern the newborn's movements, which are automatic and beyond the newborn's control.

reflexive smile A smile that does not occur in response to external stimuli. It happens during the month after birth, usually during sleep.

rejected children Children who are infrequently nominated as a best friend and are actively disliked by their peers.

report talk Talk that is designed to give information and includes public speaking.

rite of passage A ceremony or ritual that marks an individual's transition from one status to another. Most rites of passage focus on the transition to adult status.

romantic love Also called passionate love, or eros, romantic love has strong sexual and infatuation components and often predominates in the early period of a love relationship.

rooting reflex A newborn's built-in reaction that occurs when the infant's cheek is stroked or the side of the mouth is touched. In response, the infant turns his or her head toward the side that was touched, in an apparent effort to find something to suck.

S

scaffolding Parents time interactions so that infants experience turn-taking with the parents.

schemes In Piaget's theory, actions or mental representations that organize knowledge.

scientific method An approach that can be used to obtain accurate information. It includes these steps: (1) conceptualize the problem, (2) collect data, (3) draw conclusions, and (4) revise research conclusions and theory.

secondary circular reactions Piaget's third sensorimotor substage, which develops between 4 and 8 months of age. In this substage, the infant becomes more object-oriented, moving beyond preoccupation with the self.

secure attachment style An attachment style that describes adults who have positive views of relationships, find it easy to get close to others, and are not overly concerned or stressed out about their romantic relationships.

securely attached babies Babies that use the caregiver as a secure base from which to explore the environment.

selective attention Focusing on a specific aspect of experience that is relevant while ignoring others that are irrelevant.

selective optimization with compensation theory The theory that successful aging is related to three main factors: selection, optimization, and compensation.

self-concept Domain-specific evaluations of the self.

self-conscious emotions Emotions that require self-awareness, especially consciousness and a sense of "me"; examples include jealousy, empathy, and embarrassment.

self-efficacy The belief that one can master a situation and produce favorable outcomes.

self-esteem The global evaluative dimension of the self. Self-esteem is also referred to as self-worth or self-image.

self-understanding The child's cognitive representation of self, the substance and content of the child's self-conceptions.

semantic memory A person's knowledge about the world—including a person's fields of expertise, general academic knowledge of the sort learned in school, and "everyday knowledge."

semantics The meaning of words and sentences.

sensation The product of the interaction between information and the sensory receptors—the eyes, ears, tongue, nostrils, and skin.

sensorimotor play Behavior engaged in by infants to derive pleasure from exercising their existing sensorimotor schemas.

sensorimotor stage The first of Piaget's stages, which lasts from birth to about 2 years of age; infants construct an understanding of the world by coordinating sensory experiences with motoric actions.

separation protest An infant's distressed crying when the caregiver leaves.

seriation The concrete operation that involves ordering stimuli along a quantitative dimension (such as length).

service learning A form of education that promotes social responsibility and service to the community.

sexually transmitted infections (STIs) Diseases that are contracted primarily through sex.

sexually transmitted infections (STIs) Infections that are contracted primarily through sexual contact, including oral-genital and anal-genital contact.

shape constancy The recognition that an object's shape remains the same even though its orientation to us changes.

shared environmental experiences Siblings' common environmental experiences, such as their parents' personalities and intellectual orientation, the family's socioeconomic status, and the neighborhood in which they live.

short-term memory The memory component in which individuals retain information for up to 30 seconds, assuming there is no rehearsal of the information.

sickle-cell anemia A genetic disorder that affects the red blood cells and occurs most often in people of African descent.

simple reflexes Piaget's first sensorimotor substage, which corresponds to the first month after birth. In this substage, sensation and action are coordinated primarily through reflexive behaviors.

size constancy The recognition that an object remains the same even though the retinal image of the object changes as you move toward or away from the object.

slow-to-warm-up child A child who has a low activity level, is somewhat negative, and displays a low intensity of mood.

small for date infants Also called small for gestational age infants, these infants' birth weights are below normal when the length of pregnancy is considered. Small for date infants may be preterm or full term.

social clock The timetable according to which individuals are expected to accomplish life's tasks, such as getting married, having children, or establishing themselves in a career.

social cognitive theory The view of psychologists who emphasize behavior, environment, and cognition as the key factors in development.

social cognitive theory of gender A theory that emphasizes that children's gender development occurs through the observation and imitation of gender behavior and through the rewards and punishments children experience for gender-appropriate and gender-inappropriate behavior.

social constructivist approach An approach that emphasizes the social contexts of learning and that knowledge is mutually built and constructed. Vygotsky's theory reflects this approach.

social contract or utility and individual rights The fifth Kohlberg stage. At this stage, individuals reason that values, rights, and principles undergird or transcend the law.

social conventional reasoning Thoughts about social consensus and convention, in contrast to moral reasoning, which stresses ethical issues.

social play Play that involves social interactions with peers.

social policy A national government's course of action designed to promote the welfare of its citizens.

social referencing "Reading" emotional cues in others to help determine how to act in a particular situation.

social role theory A theory that gender differences result from the contrasting roles of men and women.

social smile A smile in response to an external stimulus, which early in development is typically a face.

social systems morality The fourth stage in Kohlberg's theory of moral development. Moral judgments are based on understanding the social order, law, justice, and duty.

socioeconomic status (SES) Refers to the grouping of people with similar occupational, educational, and economic characteristics.

socioemotional processes Changes in an individual's relationships with other people, emotions, and personality.

socioemotional selectivity theory The theory that older adults become more selective about their social networks. Because they place a high value on emotional satisfaction, older adults often spend more time with familiar individuals with whom they have had rewarding relationships.

source memory The ability to remember where one learned something.

stability-change issue Involves the degree to which we become older renditions of our early experience (stability) or whether we develop into someone different from who we were at an earlier point in development (change).

standardized test A test with uniform procedures for administration and scoring. Many standardized tests allow a person's performance to be compared with the performance of other individuals.

Strange Situation An observational measure of infant attachment that requires the infant to move through a series of introductions, separations, and reunions with the caregiver and an adult stranger in a prescribed order.

stranger anxiety An infant's fear and wariness of strangers; it tends to appear in the second half of the first year of life.

strategies Deliberate mental activities to improve the processing of information.

sucking reflex A newborn's built-in reaction to automatically suck an object placed in its mouth. The sucking reflex enables the infant to get nourishment before he or she has associated a nipple with food and also serves as a self-soothing or self-regulating mechanism.

sudden infant death syndrome (SIDS) A condition that occurs when an infant stops breathing, usually during the night, and suddenly dies without an apparent cause.

sustained attention Focused and extended engagement with an object, task, event, or other aspect of the environment.

symbolic function substage Piaget's first substage of preoperational thought, in which the child gains the ability to mentally represent an object that is not present (between about 2 and 4 years of age).

syntax The ways words are combined to form acceptable phrases and sentences.

T

telegraphic speech The use of short and precise words without grammatical markers such as articles, auxiliary verbs, and other connectives.

temperament Involves individual differences in behavioral styles, emotions, and characteristic ways of responding.

teratogen From the Greek word *tera,* meaning "monster." Any agent that causes a birth defect. The field of study that investigates the causes of birth defects is called teratology.

tertiary circular reactions, novelty, and curiosity Piaget's fifth sensorimotor substage, which develops between 12 and 18 months of age. In this substage, infants become intrigued by the many properties of objects and by the many things that they can make happen to objects.

theory An interrelated, coherent set of ideas that helps to explain and make predictions.

theory of mind The awareness of one's own mental processes and the mental processes of others.

top-dog phenomenon The circumstance of moving from the top position in elementary school to the lowest position in middle or junior high school.

transitivity The ability to logically combine relations to understand certain conclusions.

triarchic theory of intelligence Sternberg's theory that intelligence consists of analytical intelligence, creative intelligence, and practical intelligence.

trophoblast The outer layer of cells that develops in the germinal period. These cells provide nutrition and support for the embryo.

Turner syndrome A chromosome disorder in females in which either an X chromosome is missing, making the person XO instead of XX, or the second X chromosome is partially deleted.

twin study A study in which the behavioral similarity of identical twins is compared with the behavioral similarity of fraternal twins.

U

umbilical cord A life-support system containing two arteries and one vein that connects the baby to the placenta.

universal ethical principles The sixth and highest stage in Kohlberg's theory of moral development. Individuals develop a moral standard based on universal human rights.

V

visual preference method A method used to determine whether infants can distinguish one stimulus from another by measuring the length of time they attend to different stimuli.

Vygotsky's theory A sociocultural cognitive theory that emphasizes how culture and social interaction guide cognitive development.

W

Wernicke's area An area in the brain's left hemisphere that is involved in language comprehension.

whole-language approach An approach to reading instruction based on the idea that instruction should parallel children's natural language learning. Reading materials should be whole and meaningful.

wisdom Expert knowledge about the practical aspects of life that permits excellent judgment about important matters.

working memory The mental "workbench," where individuals manipulate and assemble information when decision making, problem solving, and comprehending language.

X

XYY syndrome A chromosomal disorder in which males have an extra Y chromosome.

Z

zone of proximal development (ZPD) Vygotsky's term for tasks too difficult for children to master alone but that can be mastered with the assistance of adults or more-skilled children.

zygote A single cell formed through fertilization.

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Chapter 16

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Chapter 19

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